

EXHIBIT “C”





Causation, Scope of Repair and Code Submission

Insured: Haman, Inc.

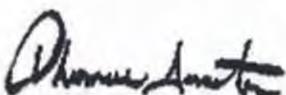
Insurance Company: Chubb Custom Insurance Company

Dates of Loss: March 22, 2014 and April 28, 2014

Property: Knights Inn at 1121 9th Ave. SW, Bessemer, AL 35022

This Report includes the opinions that I have regarding causation, scope of repairs applicable codes for the 2- losses to the Knights Inn owned by Haman, LLC. that resulted from the fire loss of March 22, 2014 and the windstorm/hail loss of April 28, 2014. Forensic Building Science conducted inspections of the property on July 7-9, 2015. Prior to that inspection, I made a brief scoping site visit on June 15, 2015 to establish the eventual inspection protocols. In addition, and prior to issuing this report, I re-inspected the property on April 24, 2019 to refamiliarize myself with the property. This Report also includes the sources relied upon for my opinions, my qualifications, my past testimony and my fee schedule. I reserve the right to supplement or expand this opinion statement as I believe necessary on the merits of any additional information that becomes available.

Testimony I have given over the last four (4) years is listed in the enclosed CV.



Thomas J. Irmiter

April 26, 2019

Thomas J. Irmiter

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 4/23/19

Licenses/Certifications

State of Minnesota Building Official, <i>License# LB002764</i>	2006-22
International Code Council, Residential Building Inspector, <i>Certification# B1</i>	2008-21
International Code Council, Property Maintenance & Housing Inspector, <i>Certification# 64</i>	2008-21
International Code Council, <i>Professional Member# 5313388</i>	2007-08
International Code Council, <i>Corporate Member# 8053289</i>	2015-22
Insurance Appraisal & Umpire Association Member and Certified Appraiser/Certified Umpire	2017-19
Metro Skywarn Spotter, <i>ID# 7154</i>	2015-17
Certified Vinyl Siding Installer, <i>ID# 18025</i>	2015-18
Certified Renovator- Lead Safety	2015-22

Work Experience

Forensic Building Science, Inc., Owner/Principal	2004 to Present
<ul style="list-style-type: none"> • Forensic analysis and evaluation of water intrusion behind exterior boundary walls on residential single-family, two-family, multi-family dwellings and commercial low rise and high-rise buildings. • Causation analysis of failed foundation, wall, floor, curtain wall and roof assemblies • Evaluation of Codes and Standards including manufactures requirements • Evidence collection and on-site documentation of remediation and repairs • Producing project specifications • Construction and Insurance dispute resolution and Arbitration • Fenestration and curtain wall testing and deconstruction • Causation analysis • Project management and project cost estimating using Industry standard methods • Staged site inspection and documentation on new homes and structures undergoing renovations and repairs including footing, framing, weather barrier, roofing, fenestrations inspections, and insulation and ventilation inspections • Comparative bids and job cost analysis and project scope analysis • Bulk mold, soot, and lead sampling • Infrared and moisture infiltration studies • Clean room design defects • Review and evaluation of construction documents • Inspection on first-party losses including fire, wind, hail, ice dams, hurricanes, tornadoes, floods, pipe burst, vehicle impact • First-party loss claim inspections for building owners and insurance companies • Pitched and flat roof and facade inspections including EPDM, copper, metal standing Seam, TPO, BUR, Mod Bit, shingles, tile, slate, flashing, stucco, EIFS, brick, stone, vinyl siding, Hardi-composite siding, wood siding and CMU. • Insurance appraisals as umpire and appraiser • Pre-sale due diligence inspections 	

As principal of FBS, Mr. Irmiter conducts on-site inspections and evaluations (both non-invasive and destructive) of foundation assemblies, wall assemblies, curtain and storefront walls, soffit assemblies and attic/roof assemblies to evaluate as-built conditions and determine causation for damages to these various assemblies. Preparing project specific repair scopes and unit price estimates as well as obtaining and reviewing bids from licensed contractors are also part of Mr. Irmiter's duties. Evaluation of applicable codes and standards in place at the time of original construction and at time of a loss, as well as, expert witness testimony regarding causation for both Federal and district court cases and first party appraisals, scope of repairs and applicable building codes and standards are also part of Mr. Irmiter's work.

Mr. Irmiter has conducted inspections in Alabama, Arizona, Arkansas, Colorado, California, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Massachusetts, Mexico, Michigan, Minnesota, Mississippi, Missouri, Nebraska, New Mexico, New York, New Jersey, North Carolina, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Puerto Rico, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, U.S. Virgin Islands, Virginia, and Wisconsin.

Advanced Building Solutions, Inc., Senior Consultant

2003-04

- Construction litigation consulting
- Principal expert witness for the company
- Forensic analysis of construction defects, including on-site testing
- Window deconstruction
- Building code evaluations
- Water intrusion studies and reports
- Water penetration testing
- Expert witness on three arbitrations and two court cases
- 8 depositions and numerous affidavits
- 15 mediations
- Final analysis of damages
- First party disputes

Responsible for on-site forensic destructive testing to determine problems related primarily to bulk water intrusion. Review all evidence gathered from full remediation projects and issue pertinent reports. Maintain and update a database of project costs representing a cross-section of contractors and project types. Research and test various products used to construct wall assemblies. Develop and maintain a protocol for destructive evaluations of fenestrations. Assist in developing and implementing "Best Practices" and protocols for remediation projects including partner contractor training.

Donnelly Management Services, Inc., Forensic Architectural Specialist

2002-03

- Developed concept of a service to represent home owners experiencing failures to their homes as a result of water infiltration issues
- Created initial "Best Practices" for Donnelly Stucco for their involvement in the full remediation process
- Documented and issued pertinent reports on discoveries at failed structures, both residential and commercial
- Established and maintained protocols for on-site documentation and evidence gathering and storage
- Principal expert witness for company
- Established template for water intrusion reports including creation of terms in use by other consultants today

- Created some of the first full remediation specifications and templates in use by other firms today
- Developed a percentage of damages theory used in mediations today
- Developed a unit cost template still used by others today

Donnelly Stucco Sales, Sales Manager

2001-02

- Residential and commercial stucco sales and design for traditional 4-coat, proprietary 2-coat, and EIFS systems
- Daily sales for residential re-stucco and stucco related repairs
- Initial forensic destructive testing in spring of 2002
- On-site, hands-on involvement in remediation and reconstruction process
- Management of sales leads
- Maintain company marketing program
- Prepare all estimates including new construction stucco work
- Prepare and execute contracts
- Assist clients with color and texture designs
- Attend pre-job meeting with client and Donnelly plastering staff person
- Worked in the field as an installer from time to time

Irmiter Contractors & Builders, Ltd., President

1984-00

Company received numerous local and national awards for design, management and implementation until unsuccessful merger acquisition of House of Dreams, LLC in 2000. This acquisition caused the company to close in January 2001.

In 1984, Mr. Irmiter purchased the assets of his father's sole proprietor business and formed Irmiter Contractors and Builders, Ltd. His training and education included:

- Application of Building Codes and Standards into practical field applications
- Advanced framing using floor truss systems
- Installation of flanged windows
- Installation of new product from Dupont called Tyvek
- Job sequencing and project scheduling
- Xactimate training and use
- Introduction to CAD design
- Use of Simpson fasteners and connectors to obtain structurally rated assemblies
- Point load design
- Requirements for Historic Restoration
- Steel beam and column construction
- Insulation and ventilation techniques
- Calculating loads on wall, floor and roof assemblies including mathematical formulas
- Blue print reading and materials take-offs
- Building codes and standards by geographic region including UBC, BOCA, WDC and Model Energy Code
- Administration of construction projects
- Construction contracts and project specifications
- Fastening schedules for various components including, studs, plates, headers, sheathing, lath, weather barriers, and ledgers
- Calculating live load, dead loads, and snow loads
- Site layout and drainage

- Basic mechanical and electrical
- Received 100 hours of field training from Chevron Corporation on use of Chevron Industrial Membrane (CIM) for use on flat roof applications and pond liners. Install CIM product on over 50 residential and commercial structures over a four-year period. Product used to replace standard five-ply hot mop systems in place at the time. Included specific training on wall-to-roof flashing details, flashing at posts and penetrations, pitch pockets and special applications on vertical surfaces
- Received 40 hours training from manufacturer of EPDM systems including ballast system install, mechanical fastener install, and full adhesion system install. Installed various system membranes on flat roofs for ten-year period, including BUR and Mod Bit
- Received over 100 hours of training from Marvin Windows and their representatives, including John Taylor, on proper installation for and of Marvin windows and doors including sizing, measuring, layout, field mulling, structural field mulling, and designing window walls
- Direct training by Velux America through the W.J. White Company in Bloomington, Minnesota on installation and field service modification of Velux roof windows. 40-hour training included modification of engineered trusses for installation of oversized skylights, complex framing of skylight shafts, proper flashing techniques for skylights and roof windows on sloped and non-sloped roofs, and gag framing and flashing of skylights and roof windows. Personally, spent five years (approximately 3000 hours) trouble shooting and repairing improper insulations (leakers) in five state area, including commercial applications. Developed and installed first gang-flash system using low pitched roofing kit on flat roof; still in use today. Installed over 1500 roof windows and skylights from 1980-1990 including low-sloped applications
- Direct training by Solarium Systems Inc, Bloomington, Minnesota, Lord and Burnham Greenhouse Systems and Four Seasons Greenhouse through W.J. White Company for:
 - Erection and construction of glass solariums
 - Six-month training period (1000 hours) included both class room and actual hands-on training on manufacturing at the plant
 - Including cutting extrusions
 - Installing weep tracks
 - Installing glazing tapes and glazing panes
 - Installing mull covers
 - Integration of operable fenestration components including windows doors and fan systems
 - Building and designing heat sink collectors using insulated slab on grade and wood foundations
 - Heat wall and trompe wall designs
 - Complex hip unit solariums and multiple unit designs and structurally rated extrusions and where to use these
 - Spread mull techniques and structurally rated mull assemblies
 - Integrating site built and erected solariums into wall and roof assemblies and proper flashing techniques
 - Installed over 100 solariums and solariums component systems for W.J. White during five-year period on both residential and commercial structures

Bud Irmriter Remodeling, Master Carpenter

1976-84

Worked full-time as a lead carpenter supervising numerous crews. Additional training included:

- Specification writing
- Blue print reading and materials take offs for complex projects
- Integration of subcontractors and project scheduling
- Proper job sequencing

- Design and installation of wood foundation systems
- All aspects of framing
- Advanced electrical rough in
- Re-supporting houses with off-set bearing walls
- Re-supporting failed and sagged footings, posts, beams and wall structures
- Changing structural bearing points
- Interior finishing trim including stair construction
- Multi-level deck design
- Advanced cabinet making
- Cabinet and countertop lamination
- Advanced plumbing including relocation of and offsetting of soils and waste pipes
- Working with poly retarders and un-faced insulation
- Training and installation of EPDM roofing and related materials
- Installing windows and doors
- Installing various types of siding
- Installing roofing products

Bud Irmite Remodeling, Apprentice Program

1969-76

Received the following extensive training:

- Masonry
- Carpentry – which including all aspects of framing, siding, windows and roofing
- Stucco and brick
- Electrical, plumbing and heating
- Interior plastering and decorating
- Cabinet making
- Roofing (standard shingle, cedar shake, tile, slate, flashing details, chimney rebuilding and tuck pointing, BUR)

Specific duties and training in:

1969-71

- Clearing job sites particularly on the residential roofing projects
- Learning to properly stack and cover framing lumber
- Installing mop down starter edge and 90 lbs. rolled roofing (this was prior to the development of ice and water shield)
- Installing 18-inch lap to the weather rolled roofing on flat and slightly BUR (this was prior to EPDM membranes)
- Scrapping and priming exterior homes
- Sanding gypsum board
- Cutting and installing ceramic tile
- Concrete mixing

(Except for 10-month City of Minneapolis Internship)

1971-95

- Advanced framing including layout of floors, walls, roof structures, bearing points, point loads, stairs etc.
- Installation of metal roof flashing and underlayment flashing
- Installation of three-tab shingles and metal valleys
- Tuck pointing chimneys, rebuilding chimneys and chimney flashing
- Construction of chimney saddles and crickets
- Installation of lead flashing on tile roofs and tile and slate roof repairs
- Solder jointing metal roofing

- Inboard gutter repair and rebuilding
- Surface mounted gutter installations
- Foundation water proofing
- Wall framing and layout
- Installation of weather resistive barriers
- Installation of Kraft Faced insulation
- Gypsum board installation
- Fire taping Gypsum board
- Interior and exterior painting and staining
- Glass and sash chord replacement
- Repair and rebuilding of double hung windows
- Selection of wood and basic cutting of components for cabinet making
- Excavation and site preparations
- Foundation and footing layout
- Footing installation, including post, ledge and spread footings
- Block installation
- Installation of drain tiles
- Wood and steel siding installation
- Plywood and Bildrite sheathing installation
- Installation of lath and stucco
- Stucco re-dashing
- Gypsum board taping and plaster repair
- Spray texturing
- Wall papering and painting including faux and glazing
- Removal of lead and galvanized water pipes and installation of copper water pipes
- Removal and installation of hot water boilers
- Installation of carpet and linoleum
- Installation of wood floors including floor refinishing
- Stripping and refinishing wood work
- Retrofitting new headers without installing temporary support walls
- Advanced cabinet making including mortise and tenon work
- Basic electrical rough in

Office of Public Information, City of Minneapolis, Director

1977-78

Reported directly to City Clerk, Lyle Schwarzkopf. Managed staff of eight people. Responsible for publishing monthly city employee newsletter. Assisted in lobbying effort for proposed stadium in Downtown Minneapolis. Received training from federal energy agency for thermography study regarding heat loss in residential structures; including extensive training on interpreting infrared images, convective loops and negative plain pressure as these relate to improper insulation and ventilation procedures and percentage of heat loss attributable to wall and roof assemblies. Implemented and delivered secondary training to citizens in local wards for presentation of the thermography images that were taken by the federal energy agency in conjunction with the Department of Housing and Urban Development (HUD). Personally, inspected approximately five homes in each ward (total of 50) to verify accuracy of testing procedures and make recommendations for proper insulation and ventilation of the attic areas.

Construction Consulting Experience

1985 to Present

- Expert witness testimony for both Plaintiffs and Defendants
- Destructive inspections on over 2500 residential properties
- Inspection of over 7500 Buildings
- WCCO (CBS Affiliate) I-Team investigation of local Home Builders on "Houses from Hell", Pajec Residence, Apple Valley, Minnesota (1991)
- Principal designer for ICB, Ltd. on over 1500 residential and commercial remodeling and renovation projects
- Developed installation strategies for Andersen Renewal Windows, including changes in flashing and flange designs
- Named by Hennepin County District Court Judge in 1998 to serve as sole arbitrator on construction dispute between Silver Bullet Construction and one of their clients
- Consulted for Marvin Windows only window store in St. Louis, Missouri for four years
- Consulted for the NAHB Research Center in Washington D.C. for four years
- Consulted with Malcolm Baldrich Institute in Washington D.C. and was part of five-person team to develop national quality standards for residential construction

Guest Lecturer

1986 to Present

- National Convention for NARI, 1986 – 1999
- International Symposium on Sustainable Housing Insulation in Northern climate houses, 1988
- City of St. Paul. District 14 Council, Annual Remodeling Exposition, 1990 - 1995
- National Conventions for NAHB, 1990 - 1998
- National Convention for NKBA, 1990 – 1998
- Remodelers Council: Anderson Windows, Marvin Windows, and Covey Institute, 1990 - 1999
- National Leadership Conference – Construction Management, Sponsored by NAHB, Hanley Wood, Andersen Windows, 1998
- ASHI – How to Inspect for Water Intrusion Current Methodologies, 2003
- Mold Summit, Chicago IL, 2005
- 54th Annual IBC Officials Meeting
- IFMA – Evaluating Existing Buildings – Ordinance & Law Issues in Insurance Policies
- Annual Building Officials Institute Guest Lecturer
- Annual Meeting Presenter for NARI, 2016
- GAPIA Fall Educational Conference Speaker, 2016
- NAPIA Mid-Year Meeting Presenter, 2017

Education

• Hamline University	Bachelor of Arts Degree	1979
• AWCI International	Mold Remediation and Site Documentation	2002
• University of Wisconsin (School of Engineering)	Advanced Project Management Class	2007

Advanced Product Training Seminars and Courses

2007

- State of Minnesota Department of Labor and Industry
(40 hours, Test for Certified State Building Official (CBO LTD) (Limited to one and two family residential, and small commercial and accessibility codes))
- Received designation as RBI for the ICC. Lic. No. 5313388-B-1

Solarium Systems, Inc., Lord and Burnham Green, and Four Seasons	1986
<ul style="list-style-type: none"> • Erection and construction of glass solariums • Six-month training (1000 hours) included both classroom training and actual hands on manufacturing at the plant • Including cutting extrusions • Installing weep tracks • Installing glazing tapes and glazing panes • Installing mull covers • Integration of operable fenestration components including windows doors and fan systems • Building and designing heat sink collectors using insulated slab on grade and wood foundations • Heat wall and trompe wall designs • Complex hip-unit solariums and multiple unit designs and structurally rated extrusions and where to use these • Spread mull techniques and structurally rated mull assemblies • Integrating site-built & erected solariums into wall & roof assemblies & proper flashing techniques 	
National Association for the Remodeling Industry (NARI)	1989-02
<ul style="list-style-type: none"> • Advanced framing using floor truss systems • Installation of flanged windows • Supplemental Xactimate training • New product from DuPont called Tyvek • Job sequencing and project scheduling • Introduction to CAD design • Use of Simpson fasteners and connectors to obtain structurally rated assemblies • Insulation and ventilation techniques 	
1989-2006 – Attended NARI Annual convention and took a minimum 12 hours (200 plus hours) CEUs each year on the following:	
<ul style="list-style-type: none"> • Weather resistive barriers, including “D” paper, Pink wrap and Typar • Window and door flashing • CAD design • Computer aided estimating –“Xactimate system” • Peachtree estimating system • Xactimate training • Vapor retarders • Insulation • Ventilation • Roofing – EPDM, TPO, Mod Bit, steel, metal & Elastomeric • Fasteners and connectors • Compute aided structural analysis • Caulks and sealants • Tyvek, including an additional 10 hours direct training by Dupont in Florida in 1999 on new product call stucco wrap and flex wrap. • MFM brand window tape seminar • Pella Window Tape Seminar 2002, Indianapolis, Indiana • Building Science Corporation, Joe Listerbeck, water intrusion diagnosis and repair, 2002, Indianapolis, Indiana • Complex framing using LPI and TJI joists and connectors 	

- Using OSB as a structurally rated panel
- Barrier free design
- Proper installation of kick-out flashing, AWCI, 2002, San Antonio, Texas
- What causes mold? AWCI 2002
- Plaintiffs Mold Summit 2005 (16 hours training)

National Association for the Remodeling Industry Certified Remodeler Test 1990

- Calculating loads on wall, floor and roof assemblies
- Blue print reading and materials take-offs
- Building codes and standards by geographic region including UBC, BOCA, WDC and Model Energy Code
- Administration of construction projects
- Construction contracts and project specifications
- Fastening schedules for various components including, studs, plates, headers, sheathing, lath, weather barriers, and ledgers
- Calculating live load and dead loads and snow loads
- Site layout and drainage
- Basic mechanical and electrical

State of Minnesota Continuing Education:

1993-2000: 42 hours CEUs, to maintain contractors' license

- Additionally, taught classes required for contractor continuing education including Lead Safety Training. At that time, Mr. Irmiter was the only non-State of Minnesota Department of Health person qualified by the Department of Commerce to teach Lead Safety Training.

Code Official Licensing Requirements:

2019: Attended 63rd Annual Institute for Building Officials. 35 CEUs

- State of the State
- Understanding the Roles of Participants in Emergency Response to Catastrophic Damage
- Firestop from an Inspection Standpoint
- Concrete and Reinforcing Steel Observations
- Structural Steel Observations
- Soils and Building Code
- The Remodeling Conundrum: When the Order Matters
- Ventilation: The Many Sides of Air
- 2018 IBC and IFC Fire Protection Systems
- Legal Aspects of Code Administration
- Building Inspector Roundtable

2019: Environmental Issues, 3hr course

2016: 2012 IBC Performing Nonstructural Plan Review, 24 CEUs

2015: Attended 59th Annual Institute for Building Officials, 18 hours CEUs

- The "State of the State" - Construction Regulation
- Update to MN Rule 1322 "Residential Energy"
- MN Amendments for 2012 IEBC
- MN Amendments for 2012 IRC
- Residential Masonry & Concrete
- Residential Deck Connections
- Legal Perspectives in Code Enforcement
- Tenant/Landlord Law Overview for Inspectors
- Application of International Mechanical Code to Existing Housing

2015: 2012 IBC Inspection of Fire-Resistant Rated Walls, Floors, Ceilings & Roofs, 7 CEUs
2015: Basic Techniques of Install of Vinyl Siding, 5 CEUs
2015: Lead Safety for Renovation, Repair & Painting, 8 CEUs
2013: Attended 57th Annual Institute for Building Officials, 24 hours CEUs
• 2012 IRC Fundamentals- Building Provisions
• IRC Changes 2006-2012
• Application of the 2012 IEBC
2012 IRC Wall Bracing
2010: Attended 55th Annual Institute for Building Officials

First Party Claims Conference

2017 Attendee

- Problems and Solutions Under Law and Ordinance and Code Upgrade Coverage- Finley Harckham, Esq., Anderson Kill Loss Advisors
- Hail Mechanics, Opacity, and Why Small Hail Can Do Big Damage- Matt Phelps, P.E., APEC, LLC
- New Developments in the Engineering Investigation of Wind/Hurricane Damage- Neil Hall, Ph.D., P.E., AIA, Neil Hall & Associates
- The Million Dollar Question ... Literally: How to Determine the Date of Loss for Hail and Wind Claims- Howard Altschule, CCM, Forensic Weather Consultants, LLC

2015 Attendee

- Appraisals-Strategies and Techniques to Effectively Manage Process
- Judging the Validity and Efficacy of Engineering and other Expert Reports
- Little Known Technologies in Residential & Commercial Roofs
- Builders Risk and Construction Defects-Case Studies

2014 Presenter: Fire Investigation from the Perspective of the Adjuster, Insured and Investigator

Special Training

January 1993

Marvin Windows, Warroad Plant, 30 hours, factory training, including:

- Removable vs. factory applied flanges
- Sealant at flanges
- Need for drip caps
- Introduction of SDL glazing
- Change in coating process for factory finishes
- Metal frame assembly installation over wood assembly
- Authentic divided lite limitation with glazing panels
- Use of commercial products in historic residential structures
- HPC approvals for Marvin Alpine
- Installation techniques including flashing gridlines
- First look at French casement prototypes

Andersen Renewal Windows, Joint Venture

1997-99

- Liaison to Andersen Partnership Council (group of 20 contractor advisors)
- Set up 20-person installation team to install first windows developed in pilot program
- Direct consultant with Aspen Technologies and Andersen Design Team
- Recommended modifications to the product including flange system
- Glazing pockets and type of seal at glazing panel
- Drip cap design and integration
- Weep system design

- Installation techniques and requirements
- Installation costs by unit, developed one of three tracking systems.
- Consulted on advertising and marketing of product
- Received over 200 hours in training from Andersen on fenestration products, including design installation, service, sales, mar keying and distribution
- Assisted Renewal in setting up in home sales and show room sales program
- Trained first sets of Renewal sales force by personally going with them on hundreds of initial calls to see if the product would work in the proposed applications

Association of Wall and Ceilings International (AWCI) Conference 2001

- Mold Abatement and Diagnostic Techniques class
- EFIS installation techniques and establishing drainage plains
- Barrier Wall Design vs. Drain Plane Design

Remodelers Show, Indianapolis, Indiana 2002

- Pella Window installation training and techniques using Tyvek and new Pella tape system seminar
- Mold seminar taught by Dr. Joe Listerbeck
- Seminar on comparison of OSB, Dens Glass Gold and Plywood permeability

Architectural Testing Window Performance Seminar 2003

- Testing and interpreting testing results of fenestrations using AAMA and ASTM criteria
- Using ASTM E-2128 as performance criteria for evaluating water intrusion
- Class on glazing panels and U-values

University of Wisconsin 2007

- Advanced Project Management Techniques and Principles Level II – Masters Level

Additional Seminars

- ICC Residential Building Code Inspector 2008
- Overview MN Rules Chapters: 1323, 1301 & 1322 2009
- ICC Residential Property Maintenance Inspector 2009
- Performing IBC Commercial Inspections, 1-day 2010
- UL Fire Research Light Weight Instruction, 1-day 2010
- Fire Station Flashing, 1-day 2010
- Fire Rated Assemblies, 1-day 2010
- ICC – IRC Townhome Requirements, 1-day 2010
- Building Science and Building Enclosures, 2.5 days 2010, 2011
- IRC & IBC, 2-days 2012
- 2012 International Existing Building Code, 1-day 2013
- Brace Wall Panel Design, 1-day 2013
- 2012 IBC Transitions From 2006 2013

Industry Awards

- Remodeling Magazine “Big 50” Awarded as one of Top 50 contractors in the nation 1990
- First contractor in Minnesota to pass the certified remodelers test and received the Certified Remodelers Designation 1990
- Outstanding leadership award, NARI, Minnesota chapter 1989-96
- Leadership awarded each year by the Builders Association of Minnesota 1994-97
- Founded Minneapolis/St. Paul Home Tour 1994
- Criteria writer for National Quality Awards sponsored by NAHB, Washington, DC 1995
- One of four judges for National Quality Awards for NAHB 1996-98

Professional Organization Membership

- President, NARI, Minnesota Chapter 1989-91
- Presented first Uniform Model Contractor Licensing Bill for Remodelers to Builders Association of Minnesota and State legislature 1990
- Appointed to State Board Builders Association of Minnesota 1996-98
- Member of Andersen Window's Partnership Council 1996-98
- Assisted in development of Renewal window by Andersen 1997-99
- Member of American Society of Testing and Materials (ASTM) 2004-06
- International Code Council (ICC) Corporate membership 2007-18
- Better Business Bureau 2004-16
- RCI 2013-14

Department of Insurance Continuing Education Instructor

2014-18

Mr. Irmriter has been approved to teach continuing education classes for the Insurance industry in the following states:

- California
- Colorado
- Florida
- Georgia
- Minnesota
- New York State
- Pennsylvania
- Virginia

No publications published

Testimonies, Depositions & AppraisalsTestimony at District Court Trials:

1. Interlachen Property Owners Association, Inc., v American Family Mutual Insurance (2013) Hennepin County, MN Court File No. 27-CV-11-12855, Judge Bruce A. Peterson. Attorney Brenda Sauro (Sauro & Bergstrom).
2. Interlachen Property Owners Association, Inc., v Kuepers Construction, Inc. (2013) Crow Wing County, MN Court File No. 18-CV-11-5061, Judge Kristine R. DeMay. Attorney Jason Tarasek (Hammargren & Meyer).
3. 77th Street, LLC v American Family Mutual Insurance (2014) U.S. District Court of Arizona, Case No. CV 12-01910-PHX-SLG, Judge Sharon L. Gleason. Attorneys Michael Doyle & Kevin Wein (Doyle Raizner).
4. Park Monaco Association v Myra Lansky, Denver County District Court, Case No. 2012CV2370, Judge Morris Hoffman, Attorneys Milo Miller & Steven Kabler (Miller Kabler), May 18, 2015.
5. Joseph and Jennifer Roach v County of Becker v Luxury Landscaping & Lawn Care LLP, County of Becker, MN Court File No. 03-C5-05-667, Judge Jay D. Carlson. Attorney James P. Peters (James P. Peters PLLC), November 16, 2015
6. King's Cove Marina, LLC v Zinniel Electric Company, and Schwickerts Tecta America, LLC. (2016) County of Dakota, MN Court File No. 19-HA-CV-14-2282. Attorney Stephen P. Watters (Watters Law Office), May 5, 2016
7. David and Marjorie Anderson v Apex Roofing Consultants, LLC (2016) Jefferson County, CO Case No. 2016-CV-30422. Attorney Eric Schunk (Schunk & Associates).

8. Manchester Place HOA, Inc. v Owners Insurance Company, District Court of Colorado, Case No.14-cv-03226-REB-STV. Attorneys Daniel Barton, Robert Green & Wayne Collins (Robert Green Law Firm & Barton Law Firm), April 26, 2017
9. Norman Jones v State Farm, District Court of Tarrant County, Texas, Cause No. 017-279433-15. Attorneys Will Alan & Alex Nava (Allan Nava & Glander Law Firm), September 27, 2017
10. Arturo Salinas v USAA Texas Lloyd's Company, District Court, Hidalgo County, Cause No. C-1071-14-H. Attorneys Will Alan & Alex Nava (Allan Nava & Glander Law Firm), January 29, 2018
11. Joseph Garry v. Central Minnesota Renovations, Inc., Damage Assessment Division, Inc., and Andersen Corporation (2018) Dakota County, 19HA-CV-17-679. Attorneys Michael Sacchet & Mathew Korte (Ciresi Conlin), June 6, 2018
12. King's Cove Marina, LLC v Roehl Construction Company, Washington County, Court File No 82-CV-14-527. Attorney Stephen P. Watters (Watters Law Office), June 12, 2018
13. United States Roller Works, Inc v State Auto Property & Casualty Insurance, District of Tennessee, Nashville Division, No. 3:16-cv-2827. Attorney Brandon McWherter & Clint Scott (Gilbert Russell McWherter Scott Bobbitt), September 25, 2018

Testimony at Federal Court Trials:

No trials within last 4 years

First Party Appraisals & Expert Testimony:

1. Walnut Creek matter, OH, umpire 2014
2. Hawthorne Glen matter, OH, umpire 2014
3. Hoffman matter, IA, appraiser for Plaintiff 2014
4. Cauba matter, TX, appraiser for Plaintiff 2014
5. Ayala matter, TX, appraiser for Plaintiff 2014
6. Beaza matter, TX, appraiser for Plaintiff 2014
7. Cavazos matter, TX, appraiser for Plaintiff 2014
8. Conde matter, TX, appraiser for Plaintiff 2014
9. Escamilla matter, TX, appraiser for Plaintiff 2014
10. Espinoza, Sergio matter, TX, appraiser for Plaintiff 2014
11. Garza matter, TX, appraiser for Plaintiff 2014
12. Rodriguez, Ricardo matter, TX, appraiser for Plaintiff 2014
13. Villanueva/Lopez matter, TX, appraiser for Plaintiff 2014
14. Espinoza, Jose matter, TX, appraiser for Plaintiff 2014
15. Hernandez matter, TX, appraiser for Plaintiff 2014
16. Montalvo matter, TX, appraiser for Plaintiff 2014
17. Ramos matter, TX, appraiser for Plaintiff 2014
18. Casas matter, TX, appraiser for Plaintiff 2014
19. Castillo matter, TX, appraiser for Plaintiff 2014
20. Garcia, Ernesto matter, TX, appraiser for Plaintiff 2014
21. Garcia, Mario matter, TX, appraiser for Plaintiff 2014
22. Gonzalez, Raul matter, TX, appraiser for Plaintiff 2014
23. Marquez matter, TX, appraiser for Plaintiff 2014
24. Olvera matter, TX, appraiser for Plaintiff 2014
25. Pinon matter, TX, appraiser for Plaintiff 2014
26. Resendez matter, TX, appraiser for Plaintiff 2014
27. Lucio matter, TX, appraiser for Plaintiff 2014
28. Pope matter, MN, appraiser for Plaintiff 2014

29. Mendoza matter, TX, appraiser for Plaintiff 2014
30. Garcia, Isquel matter, TX, appraiser for Plaintiff 2014
31. Fogarty matter, MN, appraiser for Plaintiff 2014
32. Perez matter, TX, appraiser for Plaintiff 2014
33. Dominick matter, MO, appraiser for Plaintiff 2014
34. Colbert matter, KS, appraiser for Plaintiff
35. Windom matter, MO, umpire 2014
36. Haldeman matter, WI, appraiser for Plaintiff 2014
37. Herill matter, MN, expert testimony 2014
38. Fontana matter, MN, expert arbitration 2014
39. Sabri matter, MN, expert testimony 2014
40. Simons, 2 matters, TX, appraiser for Plaintiff 2014
41. Gonzalez, Rosendo matter, TX, appraiser for Plaintiff 2014
42. Zamarripa matter, TX, appraiser for Plaintiff 2014
43. Vasquez matter, TX, appraiser for Plaintiff 2014
44. Villas at Boulder Ridge matter, IL, appraiser for Plaintiff 2015
45. Dawson Mill Village matter, IL, appraiser for Plaintiff 2015
46. Wicklow Village Townhomes matter, IL, appraiser for Plaintiff 2015
47. Westridge Homeowners Association matter, IA, appraiser for Plaintiff 2015
48. Orchard Pointe matter, MN, appraiser for Plaintiff 2015
49. Mainali matter, TX, appraiser for Plaintiff 2015
50. Northstar Condo Association matter, IL, appraiser for Plaintiff 2015
51. Shorely Wood matter, IL, appraiser for Plaintiff 2015
52. Colonnade matter, CO, appraiser for Plaintiff 2015
53. American Star Inn- Munday matter, TX, appraiser for Plaintiff 2015
54. Travel Inn- Abilene matter, TX, appraiser for Plaintiff 2015
55. JD&B Midtown matter, ATL, umpire 2015
56. Holiday Inn Express- Coon Rapids matter, MN, appraiser for Plaintiff 2015
57. Jonah Investments/Bailey's Furniture matter, TX, appraiser for Plaintiff 2015
58. Heritage Place matter, CO, appraiser for Plaintiff 2015
59. Long Birch Lodge matter, MN, appraiser for Plaintiff 2015
60. Patrick's Fine Dining matter, MN, appraiser for Plaintiff 2015
61. Colonial Patriot HOA matter, MN, appraiser for Plaintiff 2015
62. First Evangelical Free Church matter, IA, appraiser for Plaintiff 2015
63. Delfs, Henry matter, IA, appraiser for Plaintiff 2015
64. Woodland Trail Condominium matter, IA, appraiser for Plaintiff 2015
65. Karathansas, George matter, TN, appraiser for Plaintiff 2015
66. Travel Inn- Snyder matter, TX, appraiser for Plaintiff 2015
67. Family Dollar- Raeouf, Mohammad matter, CO, appraiser for Plaintiff 2015
68. Wak Inc.- Marrakech Café matter, CO, appraiser for Plaintiff 2015
69. South Texas Education Technologies matter, TX, appraiser for Plaintiff 2015
70. La Quinta-Stephenville matter, TX, appraiser for Plaintiff 2015
71. Holiday Inn Express- Eastland matter, TX, appraiser for Plaintiff 2015
72. American Star Inn- Throckmorton matter, TX, appraiser for Plaintiff 2015
73. Poremba, Scott matter, IL, appraiser for Plaintiff 2015
74. The Willows of Vernon Hills matter, IL appraiser for Plaintiff 2015
75. Deer Run Condominium matter, IL, appraiser for Plaintiff 2015
76. Neudearborn Station matter, IL, appraiser for Plaintiff 2015
77. Motel 6-Tyler matter, TX, appraiser for Plaintiff 2016
78. Pebblewood at Pinecliff HOA matter, CO, appraiser for Plaintiff 2016

79. The Greens of Irish Prairie matter, IL, appraiser for Plaintiff 2016
80. Irish Prairie Recreation Center matter, IL, appraiser for Plaintiff 2016
81. Olde Schaumburg Row Houses matter, IL, appraiser for Plaintiff 2016
82. Olde Schaumburg Condominium matter, IL, appraiser for Plaintiff 2016
83. Villas of Gleneagle Farms HOA matter, IL, appraiser for Plaintiff 2016
84. Comfort Inn- Columbus matter, TX, appraiser for Plaintiff 2016
85. Days Inn- Ft Worth matter, TX, appraiser for Plaintiff 2016
86. Microtel- Ft Worth matter, TX, appraiser for Plaintiff 2016
87. Williamstown Apartments matter, TX, appraiser for Plaintiff 2016
88. Scholar's Walk Townhomes matter, CO, appraiser for Plaintiff 2016
89. Weaver, Sheryl matter, MN, appraiser for Plaintiff 2016
90. Delux Inn Motel matter, TX, appraiser for Plaintiff 2016
91. Buttar Family (3 matters), TX, appraiser for Plaintiff 2016
92. Greenview Inn matter, TX, appraiser for Plaintiff 2016
93. Valley View Budget matter, TX, appraiser for Plaintiff 2016
94. Masters, Ketan matter, TX, appraiser for Plaintiff 2016
95. Burleson Inn matter, TX, appraiser for Plaintiff 2016
96. Wyndham Plaza matter, TX, appraiser for Plaintiff 2016
97. Gleannloch Farms matter, TX, appraiser for Plaintiff 2016
98. EconoLodge matter, IL, appraiser for Plaintiff 2016
99. Arlington Club Condominium Association matter, IL, appraiser for Plaintiff 2016
100. Kellington matter, MN, appraiser for Plaintiff 2017
101. Historic Lemp Brewery matter, MO, appraiser for Plaintiff 2017
102. Meglio Investments matter, MO, appraiser for Plaintiff 2017
103. Summit Development/Westline Industries matter, MO, appraiser for Plaintiff 2017
104. Runaway Bay matter, IL, appraiser for Plaintiff 2017
105. Hutchins Warehouse matter, TX, appraiser for Plaintiff 2017
106. Scripture Doctors Park matter, TX, appraiser for Plaintiff 2017
107. Manors of Broadmoor matter, MO, appraiser for Plaintiff 2017
108. Silverton Condos matter, MD, appraiser for Plaintiff 2017
109. Armet matter, TX, appraiser for Plaintiff 2017
110. Pinnell Square matter, TX, appraiser for Plaintiff 2017
111. Bayview Tower matter, TX, appraiser for Plaintiff 2018
112. AMP Manufacturing matter, DE, appraiser for Plaintiff 2018
113. Salty Sway matter, Virgin Islands, appraiser for Plaintiff 2018
114. Oceanus Management matter, Virgin Islands, appraiser for Plaintiff 2018
115. Glen Oaks Townhomes matter, IA, appraiser for Plaintiff 2018
116. White Transfer & Storage matter, IA, appraiser for Plaintiff 2018
117. Robstown Enterprises- Best Western Tropic Inn matter, TX, appraiser for Plaintiff 2018
118. Palak Investments- Hampton Inn matter, TX, appraiser for Plaintiff 2018
119. Gloff Motors Inc matter, TX, appraiser for Plaintiff 2018
120. South Texas Hindu Society matter, TX, appraiser for Plaintiff 2018
121. Tamkas Management- Plantation Suites matter, TX, appraiser for Plaintiff 2018
122. Terrum Investments matters (2 Properties), TX, appraiser for Plaintiff 2018
123. Cedar Park Townhome matter, TX, appraiser for Plaintiff 2018
124. Lidhar Brothers- Airport Inn matter, TX, appraiser for Plaintiff 2018

Depositions and/or Affidavits Filed in Courts:

1. New England Compounding Pharmacy, Inc., Products Liability Litigation, State of Massachusetts. Court File No. 1:13-md-02419-FDS
2. Frank and Beth Insana v American Family Mutual Insurance, Superior Court, State of Arizona, Maricopa County, Case No. CV2011-018143, January 6, 2014
3. Rudolf and Elva Lehman v American Family Mutual Insurance, Superior Court, State of Arizona, Maricopa County, Case No. CV2011-017999, January 6, 2014
4. Henry Nguyen v American Family Mutual Insurance, District Court, District of Arizona, Case No. CV12-2103-PHX-DGC, January 6, 2014
5. Terry and Karen Vander Vulcht v American Family Mutual Insurance, Superior Court, State of Arizona, Maricopa County, Case No. CV2012-010410, January 17, 2014
6. David and Pamela Van Winkle v American Family Mutual Insurance, Superior Court, State of Arizona, Maricopa County, Case No. CV2011-018329, January 17, 2014
7. Linda Walters v American Family Mutual Insurance, Superior Court, State of Arizona, Maricopa County, Case No. CV2011-018392, January 17, 2014
8. Francisco and Gloria Magana v State Farm Fire and Casualty, Superior Court, State of Arizona, Maricopa County, Case No. CV2012-05132, January 21, 2014
9. Casa Del Pueblo HOA v American Family Mutual Insurance, Superior Court, State of Arizona, Maricopa County, Case No. CV2012-004465, February 20, 2014
10. Healthspace Regions Lancaster, LLC v Hanover Lloyd's Insurance, District Court of Dallas County, Texas, Case No. DC-13-03877-L, February 26, 2014
11. Diane and Jesse Salazar v State Farm Lloyds, District Court, Southern District of Texas, Case No. 4:13-CV-01904, March 4, 2014
12. Dominion/TM Mian v Lexington Insurance, District Court of Dallas County, Texas Case No. DC-12-13349, March 18, 2014
13. Erika Smith and Gabriel Smith v Country Mutual Insurance, Superior Court, State of Arizona, Maricopa County, Case No. CV2012-014980, April 29, 2014
14. Arlington Southern Hills, LLC v The American Insurance, District Court, Northern District of Texas, Case No. 4:13-CV-676, April 30, 2014
15. Fairways at Tagalong Condominium Association Inc, v Tagalong USA, LLC, Circuit Court, State of Wisconsin, Barron County, Case No. 12-CV-560, July 3, 2014
16. Southgate Townhome Association v Allstate Insurance, Circuit Court, Illinois, Cook County, Case No. 12 L 003185, July 15, 2014
17. Robert Howie & Jaclyn M. Moore v State Farm Lloyds and Jarvis W. Mayes, District Court, Texas, Harris County, Case No. 2013-45419, August 14, 2014
18. Carlos A. Flores Villanueva v State Farm Lloyds and Delfino Mendoza, Jr., District Court, Southern District of Texas, Case No. 7:13-CV-00601, September 17, 2014
19. La-Ben Realty LLC v Valley Forge Insurance, District Court, Northern District of Texas, Case No. 2:14-CV-00057-J, October 3, 2014
20. Avalon Condominium Association, Inc. v Secura Insurance, District Court, District of Colorado, Case No. 14-cv-00200-CMA-KMT, January 27, 2015
21. Harvey Property Management Co. v Travelers Indemnity, District Court, District of Arizona, Case No. 2:12-CV-05136-SLG, March 4, 2015
22. Patricia Schniedwind v American Family Mutual Insurance, District Court, District of Colorado, Civil Action No. 14-CV-01734-PAB-NYW, June 11, 2015
23. Shaun & Debra Oppenheimer v Allstate Fire and Casualty Insurance, District Court, District of El Paso, Case No. 2014cv31834, June 23, 2015

24. Jesus & Joanne Borrego v American Family Mutual Insurance, District Court, District of Colorado, Civil Action No. 14-cv-01732-WYD-MJW, June 24, 2015
25. The Fairway 16 Heatheridge Association v. American Family Mutual Insurance, District Court, District of Colorado, Civil Action No. 14-CV-02717-WJM-NYW, August 28, 2015
26. Charles & Laurie Leggett v State Farm Fire and Casualty Company, District Court, District of Colorado, Civil Action No. 1:14-CV-02269, November 3, 2015
27. Mark Marcucci v Great Northern Insurance Company, Eighteenth Judicial Circuit Court, County of Dupage, Illinois, 2014L000372, November 5, 2015
28. Risk Services Corp et. al. v Lexington Insurance Company, District Court, Northern District of Georgia, Atlanta Division, Civil Action File No. 1:14-cv-03322-TWT, December 18, 2015
29. Pear Ridge Creek Apartments v AIX Specialty Insurance Company et al, District Court, Dallas County, Texas, No. DC-14-0073, January 19, 2016
30. El Nacional de Oklahoma, Inc. v Travelers Casualty Insurance, District Court, Western District of Oklahoma, Case No. CIV-14-728-D, January 20, 2016
31. ADRE Country Square LLC v Westchester Surplus Lines Insurance Company, District Court, District of Colorado, Case No. 1:15-cv-00184-PAB-KMT, January 28, 2016
32. Gateway Townhomes Association, Inc v Travelers Indemnity Company, District Court, District of Colorado, Civil Action No. 1:15-cv-000395-NYW, February 5, 2016
33. Linda Patten v Allstate Insurance Company, Circuit Court, Jasper County, Missouri, Case No. 14AO-CC00065, April 20, 2016
34. OHM Properties LLC v American Family Mutual Insurance Company, Circuit Court of St. Louis, Missouri, Case No. 14SL-CC03296, July 12, 2016
35. Arthur Rawlings and American Litho Color, Inc. v American Economy Insurance Company, District Court, Dallas County, Cause No. DC-15-14509, August 31, 2016
36. Hartford Fire Insurance Company v Nationwide Magazine and Book Distributors, Inc., District Court, Northern District of Indiana, No. 3:15-cv-00265-RL-CAN, September 14, 2016
37. West Bend Mutual Insurance Company v West James Courts, Inc., Circuit Court of St Charles County, Missouri, Case No. 1511-CC00028, September 27, 2016
38. Norman & Toylaan Jones v State Farm Lloyds, District Court of Tarrant County, Texas, Cause No. 017-279433-15, October 7 & 25, 2016
39. Manchester Place HOA, Inc. v Owners Insurance Company, District Court, District of Colorado, Civil Action No. 1:14-cv-03226-REB-KLM, November 29, 2016
40. The Box Factory, Inc and CHJ Leasing, LLC v Verlan Fire Insurance Company, District Court, District of Texas, Civil Action No. 4:15-CV-861-A, December 5, 2016
41. Wilshire Manor Apartments v State Farm Insurance Company, District Court, District of California, Civil Action No. 2:16-cv-04363-R-GJS, December 6, 2016
42. Copper Ridge Owner's Association v Philadelphia Indemnity Insurance Company, District Court, Western District of North Carolina, Case No. 3:16-cv-305, April 5, 2017
43. WWMS, Inc. v Ohio Security Insurance Company, District Court, Western District of Tennessee, Civil Action No. 1:16-cv-01113, April 6, 2017
44. Northend Investors LLC v Southern Trust Insurance Company, District Court, Western District of Tennessee, No. 1:16-cv-01137 JDB-egb, April 7, 2017

45. Joe Kaniki v Texas Fair Plan Association, District Court, Tarrant County, Texas, Cause No. 342-281451-15, May 16, 2017
46. Donald Hudgins Jr. and Baker Development Company v The Netherlands Insurance Company, District Court, Tarrant County, Texas, Cause No.067-281402-15, July 20, 2017
47. Greater Bethesda Missionary Baptist Church v Philadelphia Indemnity Insurance Company, District Court, Northern District of Illinois, Case No. 1:16-CV-3351, July 27, 2017
48. Grace & Mercy Missionary Baptist Church v Texas Windstorm Insurance Association, District, Court, Galveston County, Texas, Cause No. 16-CV-0831, August 10, 2017
49. Jana Food Service v Nationwide Insurance Company, District Court, Fort Worth Division, Texas, Civil Action No. 4:16-cv-864-A, September 7, 2017
50. JNH Holding v Nationwide Property and Casualty Insurance Company, District Court, Sherman Division, Texas, Civil Action No. 4:16-cv-866-ALM, September 7, 2017
51. Wak Inc, Amal Inc, Marrakech Café v Ohio Security Insurance Company, District Court of Colorado, Civil Action No. 1:16-cv-01191-MSK-MJW, October 24, 2017
52. Welcome Properties 201, LLC v National Fire & Marine Insurance Company, District Court, District of New Mexico, No. 16-cv-01301 JCH-SMV, November 8, 2017
53. AM Royal, Inc. v Milwaukee Casualty Insurance Company, District Court of Dallas County, Cause No. DC-17-01769, November 13, 2017
54. Dena Davis v Allstate Vehicle & Property Insurance Company, District Court, Tarrant County, Cause No. 342-289965-17, November 15, 2017
55. Arturo Salinas v USAA Texas Lloyd's Company, District Court, Hidalgo County, Cause No. C-1071-14-H, December 18, 2017
56. Royal Architectural Products v Acadia Insurance Company, District Court, Potter County. Cause No. 104713-B, January 10, 2018
57. Cambridge Condominium v Peleus Insurance Company, District Court of Dallas County, Cause No. DC-17-04060, January 12, 2018
58. TBC-JR-LR, JV v Allied Property and Casualty Insurance Company, District of Texas, Fort Worth Division, Civil Action No. 4:17-CV-131-Y, February 15, 2018
59. United States Roller Works v State Auto Property & Casualty Insurance Company, District of Tennessee, at Nashville, No. 3:16-cv-02827, February 28, 2018
60. Sreeram Natarajan and Aparna Natarajan, v Brian J. McDonald and Jennifer A. Rodriguez, Circuit Court for The Eighteenth Judicial Circuit, DuPage County, Illinois, Case No. 2017 CH 273, March 15, 2018
61. Andrew Chong & Hongeng LTD v Westchester Surplus Lines Insurance Company, District Court for 55th Judicial District, Harris County, Texas, Cause No. 2016-79600, March 21, 2018
62. Fraser Crossings-Founders Pointe Condominium Association v. Intrawest/Winter Park Development Corporation, Judicial Arbiter Group, Englewood, Colorado, Case No. 2017-0633A, April 11, 2018
63. Samuel Garcia, D/B/A Calvary Memorial v Travelers Casualty Insurance Company, District Court of New Mexico, No. 2:17-cv-00423-JCH-KRS, April 23, 2018
64. Central Baptist Church of Albany Georgia, Inc v Church Mutual Insurance Company, District Court of Albany, Civil Action No. 1:16 cv00231-LJA, May 7, 2018

65. Forest Ridge Homeowners Association v Greater New York Mutual Insurance Company, Northern District Court of Illinois, Eastern Division, Case No. 1:17-cv-4193, May 17, 2018
66. Iglesia El Jordan v Church Mutual Insurance Company, District Court of Western District of Texas, San Antonio Division, Civil Action No. 5:17-cv-01077-FB, May 22, 2018
67. Mohammad Raeouf v Travelers Property Casualty Company of America, District Court of Colorado, Civil Action No. 16-cv-01974-CMA-MEH, June 11, 2018
68. Lakes of Bent Tree Condominium Association v Peleus Insurance Company, Strata Claims Management & Engle Martin & Associates, District Court of Dallas County Texas, Cause No. DC-17-10965, June 15, 2018
69. Miller Creek Holdings, LLC v Landmark American Insurance Company, District Court of Dallas County Texas, Cause No. DC-17-04796, August 20, 2018
70. HIE of St. Louis Airport, LLC v The Cincinnati Insurance Company, Circuit Court of St. Louis County MO, Cause No. 17SL-CC02582, February 27, 2019
71. Taslid Interests, Inc and Katy Motels, Inc dba Memorial Inn & Suites v Arch Specialty Insurance Company, District Court of Southern District of Texas, Houston Division, Case No. 4:18-cv-1692, April 1, 2019
72. By the Sea Council of Co-Owners Inc. v Texas Windstorm Insurance Association, District Court of Galveston County Texas, Cause No.18-CV-0529, April 3, 2019



Forensic Building Science, Inc.

DEPOSITION, TRIAL & EXPERT WITNESS FEE SCHEDULE

as of January 1, 2019

Tom Irmiter

Half day: \$2,000

Full day: \$3,500

Site visit for deposition preparation: \$400/hr plus travel time (port-to-port), airfare, lodging, car rental, cab fare, parking, meals and equipment rental

Rate of compensation to be paid for the preparation and testimony is \$400 per hour plus expenses (travel time (port-to-port), airfare, lodging, car rental, cab fare, parking, and meals)

All Field Consultants Half day: \$1,000 Full day: \$1,800

Half day: \$1,000

Full day: \$1,800

Site visit for deposition preparation: \$175/hr plus travel time (port-to-port), airfare, lodging, car rental, cab fare, parking, meals and equipment rental

Rate of compensation to be paid for the preparation and testimony is \$175 per hour plus expenses (travel time (port-to-port), airfare, lodging, car rental, cab fare, parking, and meals)

NOTE: All fees must be paid in full prior to the deposition or the deponent will not be deposed and all fees subject to change without notice.



Forensic Building Science, Inc.
Storm Damage Report

for

Knights Inn
1121 9th Avenue SW
Bessemer, AL 35023



Brian Craig Johnson, P.E.
Licensed Professional Engineer
32517

Forensic Building Science, Inc.
595 Selby Avenue
St. Paul, Minnesota 55102
Phone: 651-222-6509
Fax: 651-528-6237
www.forensicbuildingscience.com
Alabama Certificate of Authority 4389
Expires: January 31, 2016

Forensic Building Science, Inc.
595 Selby Avenue
St. Paul, Minnesota 55102
Phone: 651-222-6509
Fax: 651-528-6237
www.forensicbuildingscience.com

Client:
Howarth Group

Project Address:
Knights Inn
1121 9th Avenue SW
Bessemer, AL 35023

Jefferson County

Insurance Carrier: Chubb Custom Insurance Company, Policy #: 99783420-00
Insurance Claim #: WKFC-5689A9

FIELD REPORT FOR INITIAL STORM DAMAGE INVESTIGATION

1.0 Background Information:

1.1 Forensic Building Science, Inc. (FBS) was asked to provide an inspection of the roofs of the above-mentioned property to ascertain the extent of damage caused by tornadic winds which was reported to have occurred on April 28, 2014.

1.1.1 Reference information on storm event (tornados ranging in scale from EF1-EF2):

- Details on EF2 tornado with 120 mph winds
<http://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=523012>
- Details on EF1 tornado with 105 mph winds 3 miles to the NW
<http://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=523004>
- Details on EF0 tornado 10 miles to the west
<http://www.ncdc.noaa.gov/stormevents/eventdetails.jsp?id=522988>
- Local news story
<http://www.kptv.com/story/25369544/9-deaths-reported-as-fast-moving-tornadoes-rattle-the-south>

Storm Event Narrative from NOAA report #523012:

"The tornado touched down near Academy Drive and Southgate Lane in Bessemer and traveled to the northeast, snapping and uprooting dozens of trees along its path. In addition, dozens of homes sustained damage from downed trees. The tornado intensified with winds of 120 mph as it neared the Frank House Municipal Golf Course where the clubhouse was destroyed. The tornado continued on its northeast path, crossing the golf course, snapping and uprooting

hundreds of trees. Several homes and an apartment complex sustained significant roof damage around Memorial Drive. The tornado continued to the northeast as it paralleled 4th Avenue North. The tornado took a slight turn to the east as it crossed Alabama Highway 150, causing minor damage to a home and small restaurant. Hundreds of trees were uprooted through Bessemer, before the tornado lifted near the intersection of Dartmouth Avenue and 31st Street South.”

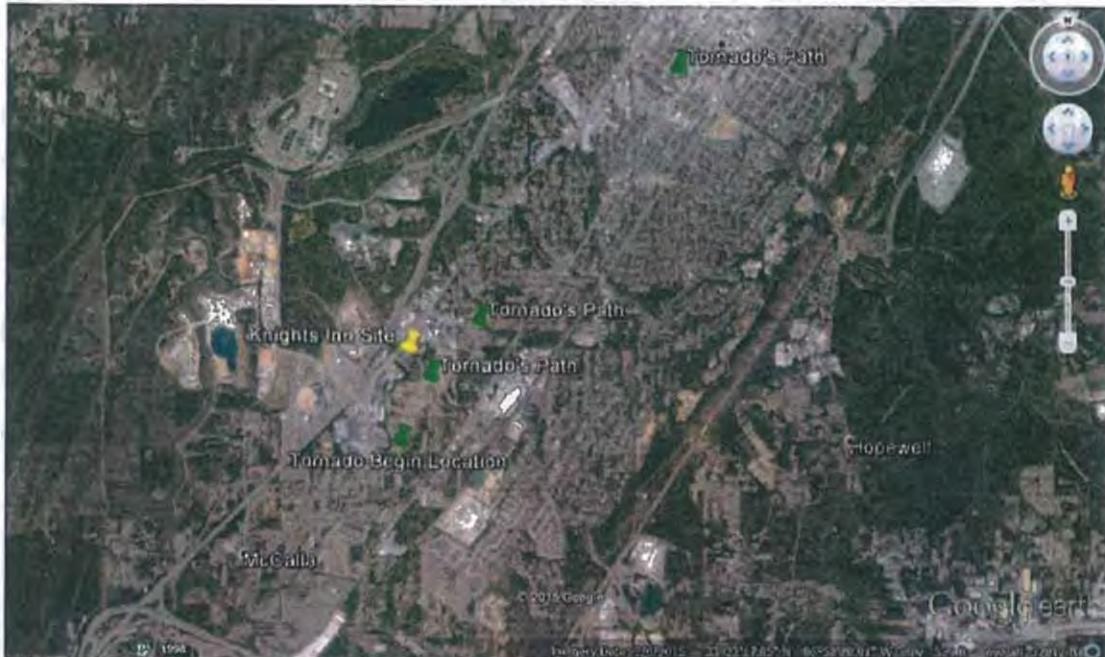
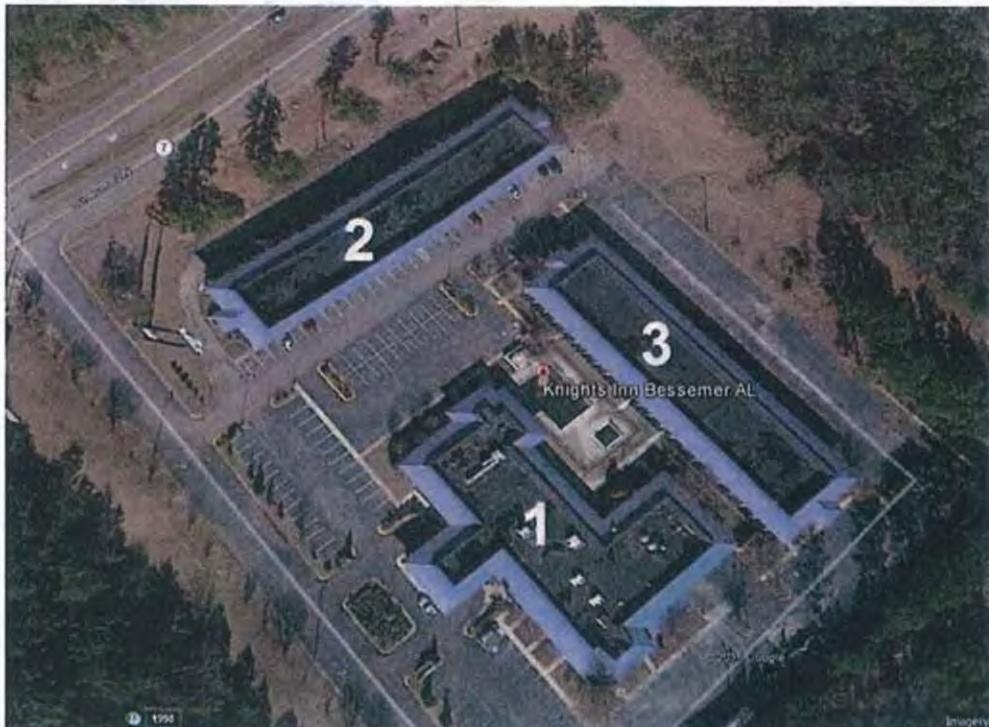


Image depicts the tornado's path as described in the narrative from NOAA Report #523012.



1.2 Satellite overview



Google Earth image with buildings numbered, dated December 12, 2013.

Forensic Building Science visited the site and took photos to document damaged locations. These photos are attached to this report.

- 1.3 Forensic Building Science personnel present at this inspection:
 - Jim Irmiter, Field Investigator (July 7 - 9, 2015).
 - Adam Piero, Field Investigator (July 7 - 9, 2015).
- 1.4 The following documents have been received:
 - Chubb Custom Insurance Policy.
 - Capture Citizen Access info on Building 1-3.
 - Realtrac info on Knights Inn property.
 - York SLA Estimate (\$34,597.92) dated April 2, 2015
 - Google Maps imagery of property.
- 1.5 According to Jefferson County Capture Citizen Access, Building 1 was constructed in 1974 [1969], and Buildings 2 and 3 in 1974 [1972] and all three buildings total 78,310 square feet.
- 1.6 The property consists of three low rise commercial buildings. One single-story building serves as a lobby, ballroom and office facilities for the hotel. The remaining structures are two-story buildings and house hotel guests (R-1 occupancy in current building codes).
- 1.7 Exterior wall finishes consist of the following:
 - Brick on masonry.
 - Stucco on lath.
- 1.8 At the time of our inspection portions of EPDM roof had been temporarily repaired with patches and tarps (see section 2.2.2 of this report).
- 1.9 The following additional documents were used for reference:
 - 2009 Building Code of Jefferson County, Alabama. (See Ordinance 1800)
 - 2009 International Building Code.
 - ANSI/ASHRAE/IESNA Standard 90.1-2007 Energy Standard for Buildings Except Low-Rise Residential.
 - Photographs and thermal imaging taken by Forensic Building Science.
 - Haag Certified Roof Inspector Program – Commercial edition – Course Workbook.
 - Construction-Generated Moisture and Its Effect On Roofing Systems, Single Ply Roofing Industry (SPRI) Technical Report, August 2008.
 - Assessing water damage to gypsum board, GA 231-06, Gypsum Association.
 - Relationship between Moisture Content and Mechanical Properties of Gypsum Sheathing—Phase 2 Research." McGowan, *11th Canadian Conference on Building Science and Technology*, held at Banff, Alberta. 2007.
 - ESR 1463, Carlisle EPDM, PVC, and TPO single-ply roofing membranes, Carlisle Syntec, reissued July 2014.

- Attaching Metal Decking, Sputo, Yantz, Criste, Modern Steel Construction, March 2010.
- ASTM D4637-2010 Standard Specification for EPDM Sheet Used in Single-Ply Roof Membrane.
- Arc-Puddle Welds and Weld Washers for Attachments in Steel Deck, Luttrell, Steel Deck Institute, reissued Jan 17, 2007.
- Deck Damage and Penetrations, Heagler, R, Steel Deck Institute, revised 2000.
- Designing with Vulcraft Steel Joists, Joist Girders, and Roof Deck, Fisher, West, and Van De Pas, Nucor Corporation, 2nd edition, 2002.
- Design of Fire-Resistive Assemblies with Steel Joists, Schultz, Modern Steel Construction, April 2003.
- Design Of Fire Resistive Assemblies With Steel Joists, Technical Digest No. 10, Steel Joist Institute, 2003

1.10 **Inspection notes:**



Google Earth, Imagery Date 12/17/2013 (before storm), approx. 2,600 ft radius.



Google Earth Imagery Date 2/6/2015 – large areas of trees to east and south gone.

- Area is surrounded by open space and sparse low-rise commercial buildings which is inconsistent with the definition of Exposure B in ASCE 7, Exposure C applies.

Surface Roughness B: Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.

6.5.6.3 Exposure Categories

Exposure B: Exposure B shall apply where the ground surface roughness condition, as defined by Surface Roughness B, prevails in the upwind direction for a distance of at least 2,600 ft (792 m) or 20 times the height of the building, whichever is greater.

- Roof deck is corrugated metal (e.g. 'B deck' or similar). Polynesian roof substrate is unknown.
- Roofing type: Raised rib metal panels. Unballasted EPDM.
- Metal roof pitch: not measured.
- EPDM roof pitch: low-slope.
- Roof Fastening: **Surface driven screws**
- Observed damage on roofs of all buildings. Damage included bent, buckled, permanently deformed, crimped and peeled roof metal flashings and panels.
- Some peeling of EPDM seams noted.
- Mechanically damaged metal roof panel in at least one location (Building 3).

- Interior water damage beneath the low slope EPDM membrane.
- Small water pools on roof (Note 3.18" (record) rainfall on July 4, 2015.)
- Membrane is not abnormally taut, which would indicate EPDM shrinkage.
- Buildings are not sprinklered.

2.0 Site Observations:

2.1 Main Roofs

2.1.1 Design and construction of the buildings are similar in all cases. Some observations are generalized from individual observations of buildings. All three buildings were inspected.

2.1.2 The building roofs are EPDM surrounded by a raised rib metal panel Polynesian style roof on all sides.

2.1.3 Mechanical damage was observed (see Figures 58-61 AP 07-08-2-15).

2.1.4 The building has a central low-slope roof covered with an ethylene propylene diene monomer (EPDM) roofing membrane. There was no manufacturer's marking on the EPDM.

2.1.5 While there are no manufacturer's specifications identified for the metal roof panels, installation was consistent with other roofs of this type and design we have inspected. EPDM is marked but does not state manufacturer. Thickness of EPDM is 60 mils, based on the manufacturer mark.

2.1.6 The EPDM is unballasted. Distress related to shrinkage (tight membrane) was not observed.

2.1.7 There were some areas where the seams had become at least partly unsealed, similar to T-peel where two pieces of membrane overlap and are sealed/joined to each other during installation. Given the water intrusion reported after the event to the interior, there are areas where the seam has been broken completely, finding these areas will best be performed with a reflected ceiling plan showing where water damaged tiles are located. Missing ceiling tiles in areas will complicate this task. Seams in some locations were at least partially intact.

2.1.8 These peeled seams are locations are possible sources for the interior water intrusion. However, there are many more locations where interior leaks are occurring other than the areas directly below the partially unsealed seams which run across the roof in lines. There are two possibilities – water entering the seams travels on the metal deck (essentially flat) that carries water up to 45 feet away until a breach is located, or from water entering at hail damaged areas and following a similar path. Seam failure is difficult to trace backwards from water intrusion due to the nature of the construction. Topside water breaching the membrane can enter at any point along the metal deck (typically 36" wide and as

long as practical) where it is attached to the open-web steel joists below due to typical 'burn through' of the field puddle welding used to typically attach these decks (See Sputo, and Luttrell).

2.1.9 Inspection Observations:

2.1.10 Building 1 (lobby, ballroom, office and restrooms). Note: References to all Figures refer to Knights Inn Building 1- Photo Log 07-08-15 & 07-09-15 AP & JDI.

- Missing pieces of flashing on metal roof. (Figures 14 & 15)
- Multiple areas where flashing is bent. (Figures 03 & 08)
- Damaged and distorted metal panels. (Figure 16)
- Signs of crimping of metal flashing. (Figure 19)
- Large areas of main roof tarped. (Figures 29, 30 & 32)
- One A/C unit condensate line leaking and draining on to roof causing large shallow pool of water. (Figure 31)
- Multiple seams partially peeling (T-peel). (Figures 36, 43 & 44)
- Multiple areas with patching and caulking around the seams. (Figures 35, 37)
- Patch with air bubble. (Figure 41)
- Damage track across panel. (Figure 58-60)
- Debris damage (Figure 61).
- Metal pulled over fasteners (Figure 73).
- Previous roof hot mopped to LWIC (Figure 83).

Core Cut #1:



- Located 15' from east wall and 20' from north wall.
- 60 millimeter EPDM single ply membrane. (Figure 46)
- 1/2" of actively wet fiberboard. (Figure 79)
- previous roof membranes left in place, \approx 3 (Figure 82).
- 2" of LWIC.
- Corrugated roof deck.

Core Cut #2:



- Located 16' from west wall and 51' from south wall.
- 60 millimeter EPDM single ply membrane.
- visually $\frac{1}{2}$ " of actively wet fiberboard cover board, saturated (Figure 92).
- previous roof membranes left in place, \approx 3 (Figure 98).
- Tan cementitious material, visually LWIC, wet (Figure 99).

Lobby observations:

- Water staining on ceiling tiles observed. (Figure 102)
- Missing ceiling tile. (Figure 105)
- Water damaged insulation. (Figure 110)
- Efflorescence and water damage on underside of deck observed. (Figure 112)

Ballroom observations:

- Water damaged carpet. (Figure 116)
- Water damaged ceiling tiles (Figure 117)
- Efflorescence and water staining on underside of deck observed. (Figure 119)
- Missing ceiling tiles and water damaged ceiling tiles. (Figure 122)
- Water damaged "sound deadening" insulation. (Figure 123)

Office observations:

- Water damaged ceiling tiles. (Figure 129)
- Missing ceiling tiles. (Figure 130)

Bathroom observations:

- Men's - Sagging and water damaged ceiling tiles observed. (Figure 135)
- Women's – Water damaged and missing ceiling tiles observed. (Figures 139, 140)
- Women's - Water damaged (discolored) floor tiles observed. (Figure 141)

2.1.11 Building 2 (80 Units): Note: References to all figures refer to Knights Inn Building 2- Photo Log 07-08-15 & 07-09-15 AP & JDI.

- Missing pieces of flashing on metal roof. (Figure 18)
- Loose metal flashing. (Figure 21)
- Multiple areas where flashing is bent or crimped. (Figure 16)

- Shallow pools of water in areas on roof. (Figure 14)
- Multiple seams partially peeling (T-peel). (Figures 54-56)
- Tear in metal flashing observed. (Figure 25 & 27)
- Loose screw at loose flashing. (Figure 32)
- Metal pulled over fasteners (Figure 36).

Core Cut #1:



- Located 8' from south wall and 10' from west wall.
- EPDM with active water (Figure 38).
- 1/2" of saturated fiberboard (Figure 39).
- previous roof membranes left in place, \approx 3 (Figure 44).
- 2" of wet foam insulation (Figure 44).
- 2" Lightweight insulating concrete (LWIC).
- Corrugated metal roof deck.

Core Cut #2:



- Located 3' from south wall and 10' from west wall.
- Fiberboard peeled off with membrane (Figure 63).
- Fiberboard saturated (Figure 67).
- Previous roof membranes, \approx 3 (Figure 69).
- 2" wet foam insulation – visually isocyanurate rigid foam board. (Figure 69).
- Wet LWIC substrate (Figure 71).

2.1.12 Building 3 (79 Units): Note: References to all figures refer to Knights Inn Building 3- Photo Log 07-08-15 & 07-09-15 AP & JDI

- Evidence of minor water evaporation zones. (Figure 20)
- Multiple seams partially peeling (T-peel). (Figures 14, 23-26)
- EPDM seam patches. (Figure 16)
- Water pooled near peeled/loose EPDM seam. (Figure 22)
- Crimping of metal flashing. (Figure 30)

Core Cut #1:



- Located 4' from west expansion and 4' from north wall.
- Active water on underside of EPDM (Figure 41).
- 1/2" of saturated and friable fiberboard (Figure 42).
- previous roof membrane, ≈ 3 (Figure 49).
- 2" of foam insulation (Figure 45).
- 2" of actively wet LWIC (Figure 48).
- Corrugated metal roof deck.

Core Cut 2:



- Located 3' from the south wall and 10' from the west wall.
- Active water underneath EPDM (Figure 61).
- Saturated fiberboard (Figure 65).
- Wet rigid insulation (Figure 67).
- Base sheet (Figure 68).
- Friable and wet cementitious material (LWIC) (Figures 70-72).
- Corrugated metal deck.

Room 153:

- Room is completely missing ceiling tiles and most of insulation. (Figure 78)
- Water damaged ceiling tiles stored in room. (Figure 84)
- Corrosion on underside of corrugated metal deck. (Figure 81)

Office Observations:

- Missing ceiling tiles. (Figure 89)
- Corrosion on underside of corrugated metal deck. (Figure 91)

Room 254:

- Water damaged ceiling tiles. (Figure 98, 99)
- Efflorescence at metal deck seam (Figure 100).

Laundry Room Observations:

- Organic growth on ceiling grid. (Figure 105)
- Water damaged ceiling tiles observed. (Figures 106, 107)
- Corrosion and efflorescence on underside of corrugated metal deck. (Figure 110)
- Missing ceiling tiles. (Figure 110)
- Water damage and organic growth observed. (Figure 112)

Room 231 Observations:

- Room is missing ceiling tiles. Sound deadening insulation hanging down with exposed kraft faced paper. (Figure 118)

Room 222 Observations:

- Room is missing ceiling tiles and most of insulation. (Figure 120)
- Light corrosion on underside of corrugated metal deck. (Figure 121)

2.2 Causation Statement

2.3 Based upon information collected from the physical inspection, review of weather data, reports of interior water intrusion (and their observed locations) following the storm event, and physical roof assessment we have concluded that the metal roof and EPDM roof membrane are wind damaged and must be completely replaced. Various metal appurtenances are damaged and must be replaced.

Finding and fixing each individual failed seam (to be certain, putting an EPDM cover plate over every seam on the entire roof, or using trial and error and waiting several months to repeat the process, etc.) would likely be unsuccessful. It will also trap water inside the wet rigid insulation which was found during roof cores and will destroy the fiberboard (which is in our opinion adhered to the EPDM, turning it into a loose-laid system), and also force the water downward, causing additional interior damage as well as creating an environment for corrosion of the structural metal deck.

2.4 Based upon information collected from the physical inspection of the interior, much of the building's interior must be replaced. Replacements include carpeting

(where used), insulation (employed here as sound-deadening), drop down ceiling tile systems and some interior walls.

- 2.5 Based upon a reasonable degree of engineering certainty, it is more likely than not that the observed damage is a result of the subject storm event and due to storm-created openings in both the metal roof and the EPDM roof. On the reported date of loss, there was sufficient wind to cause the above-referenced damage.
- 2.6 Failure to replace the roof at the property will result in additional damage due to water intrusion. Water intrusion is already occurring. Storm-created openings in the EPDM seams particularly have allowed water intrusion to penetrate down into the rest of the roof assembly. This (currently) is an R-1 (Hotel) structure with fiberboard coverboard, rigid insulation and lightweight insulating concrete on metal form / structural deck and open web steel joists with an acoustical tile ceiling.
- 2.7 In our opinion, additional costs to repair will be required to meet the current required code and manufacturer's installation instructions (e.g. tapered insulation due to required slope of currently manufactured EPDM, restoration of fire-rated roof assembly, as the building is not sprinklered. Even if it were sprinklered it is still possible the roof is a fire-rated assembly).
- 2.8 In our opinion, additional costs to repair will be required to meet the current required code or manufacturer's installation instructions.

2.9 **Discussion of repair options**

- 2.9.1 The roof exhibits peeled seams, partially unsealed seams, and unsealed seams in various areas. The water damage to the ceilings in the buildings that cannot be fully explained by mere failure of the metal roof caps where the Polynesian/Mansard style roof intersects with the sloped wall for the flat part of the main roof. Water intrusion is coming in through the EPDM membrane.
- 2.9.2 EPDM, when it is damaged, it is exceptionally difficult to find the exact flaw/penetration/breach. It is our opinion the results of roof cuts, extents of interior damage, and thermal scanning indicate that the roof is compromised by small failures in the seams located randomly across the roof (T-peel failure) as a result of tension across the seam due to wind uplift. It is clear that the metal edge securement came off this roof. Particularly of interest is Figure 36, Building 2, and Figure 73, Building 1, where the metal pulled over the fasteners. There is a great deal of water under the EPDM membrane (see roof cores, with wet cover boards, wet rigid insulation, and high water content in the LWIC) that is not inherent to the system (as constructed) or 'wicking up' from below. This is roof water leaking downward and damaging the ceiling.
- 2.9.3 This building does not have sprinklers, as this is an R-1 occupancy under current codes, it is our expectation that in the original construction, this was a fire-rated roof assembly which depends upon the ceiling tile as part of that system. The

metal deck is not sprayed with fire-proofing, the Open Web Steel Joists are not fire-proofed, etc., (See Shultz). When the ceiling tile is removed or the ceiling tile is water-damaged, it must be replaced to restore the property to a pre-loss condition. This replacement tile must be matched to the existing tiles listed as acceptable in the UL fire-rated assembly (or a change to another fire-rated assembly may be entertained with a code review by a licensed architect). Mr. Irmiter and Mr. Johnson are familiar with these requirements and their impact on construction but a licensed architect will be needed to finalize any change to this system as explained here.

- 2.9.4 Assessment always must be based primarily on observations in the field, with secondary consideration to the sparse weather data that typically exists.
- 2.9.5 Given the extent of the interior damage and the amount of water held in the fiberboard and insulation is much larger than would be expected of a couple of wind failed seams, it is our opinion that there are a multitude of breaches spread throughout the area.
- 2.9.6 Given the diffuse and sporadic damage to the roof, it is our opinion that patching is impractical and will not produce a satisfactory result (i.e. a roof that does not leak without multiple call backs.) The water damage to the fiberboard has also reduced adhesion between the membrane and the fiberboard, (no stress plates were observed, indicating that the cover board is adhered to the membrane). Water compromises the adhesion between the EPDM and the cover board (saturation of the fiberboard also destroys its strength), this roof is now more vulnerable to further wind damage in the future (the fully adhered system is gradually becoming a loose-laid unballasted system due to storm-created openings and water damage to the fiberboard).
- 2.9.7 Water damaged fiberboard is present beneath the majority of cuts performed. This material must be removed, it is generally 'counted on' to provide some of the R value of the roof, but the moisture held in the material reduces the value of the insulation. To remove it the most feasible method is cutting apart the membrane. First, if this membrane were undamaged, it would require testing to patch into with like materials. Tie-in or reinstalling roofing will require establishing that the as-is material conforms to the ASTM D4637 requirements for newly manufactured EPDM roofing (i.e. per IBC 104.11, ASTM D4637 for equivalent in performance to new roofing for breaking strength, elongation, tearing strength, low temperature bend, etc. Weather resistance testing per G151 and G155 will 'consume' parts of the roof in attempting to re-establish their validity for reinstallation.). Thus, without testing, new roofing will be required in this area as well. With testing, there will still be some shortage of material.

104.11 Alternative materials, design and methods of construction and equipment. The provisions of this code are not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by this code, provided that any such alternative has been *approved*. An alternative material, design or method of construction shall be *approved* where the *building official* finds that the proposed design is satisfactory and complies with the intent of the provisions of this code, and that the material, method or work offered is, for the purpose intended, at least the equivalent of that prescribed in this code in quality, strength, effectiveness, *fire resistance*, durability and safety.

104.11.2 Tests. Whenever there is insufficient evidence of compliance with the provisions of this code, or evidence that a material or method does not conform to the requirements of this code, or in order to substantiate claims for alternative materials or methods, the *building official* shall have the authority to require tests as evidence of compliance to be made at no expense to the jurisdiction. Test methods shall be as specified in this code or by other recognized test standards. In the absence of recognized and accepted test methods, the *building official* shall approve the testing procedures. Tests shall be performed by an *approved agency*. Reports of such tests shall be retained by the *building official* for the period required for retention of public records.

1507.12 Thermoset single-ply roofing. The installation of thermoset single-ply roofing shall comply with the provisions of this section.

1507.12.1 Slope. Thermoset single-ply membrane roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage.

1507.12.2 Material standards. Thermoset single-ply roof coverings shall comply with ASTM D 4637, ASTM D 5019 or CGSB 37-GP-52M.

Source: 2009 International Building Code.

This is a hotel complex, protection of egress and lighting should be provided during construction to protect pedestrians (including employees of the businesses).

Add the following subsections to Section 3403.1 in Chapter 34 Existing Structures in the "2009 Edition of the International Building Code."

3403.1.1 If, within any twelve (12) month period, alterations or repairs costing in excess of fifty (50) percent of the then physical value of the building are made to an existing building, such building shall be made to conform to the requirements of this Code for new buildings.

3403.1.2 If an existing building is damaged by fire or otherwise in excess of fifty (50) percent of its then physical value before such damage is repaired, it shall be made to conform to the requirements of this Code for new buildings.

3403.1.3 If the cost of such alterations or repairs within any twelve (12) month period or the amount of such damage as referred to in 3403.1.2 is more than twenty-five (25) percent but not more than fifty (50) percent of the then physical value of the building, the portions to be altered or repaired shall be made to conform to the requirements of this Code for new buildings to such extent as the Building Official may determine.

3403.1.4 For the purpose of this section, physical value of the building shall be determined by the Building Official.

3403.1.5 If the occupancy of an existing building is changed, the building shall be made to conform to the requirements of this Code for the new occupancy. If the occupancy of only a portion of an existing building is changed and that portion is separated from the remainder as stipulated in Section 706, then only such portion need be made to conform.

3403.1.6 Repairs and alterations, not covered by the preceding paragraphs of this section, restoring a building to its condition previous to damage or deterioration, or altering it in conformity with the provisions of this Code or in such manner as will not extend or increase an existing non-conformity or hazard, may be made with the same kind of materials as those of which the building is constructed; but not more than twenty-five (25) percent of the roof covering of a building shall be replaced in any period of twelve (12) months unless the entire roof covering is made to conform with the requirements of this Code for new buildings.

Source: Jefferson County amendments to Building Code.

Architectural services are needed here for proper reconstruction. Firstly, review/revision/acceptance of the ceiling/roof assembly and the current fire-rating of this structure or a sealed detail for reconstruction.

Architect should review and establish fire-rating requirements for both the roof assembly and the roof membrane based on their review of existing construction. Most commercial projects require at least a Class C roof covering (See 2009 IBC Table 1505.1). This requirement does not address the requirements for the roof assembly, which is more than just the membrane and depends on occupancy/use group and is typically a UL-listed assembly. The architect must provide a sealed detail at this location if the existing UL assembly cannot be determined.

Though we are familiar with the code requirements here, an Alabama licensed architect is required to seal an architectural detail for the appropriate repair/membrane replacement.

3.0 Conclusions:

- 3.1 Given the interior water damage, the roof assembly is water damaged to varying degrees. The existing roof deck sheathing is metal. As part of the re-roofing it will be necessary to secure approval of the decking (by the building official) that it is acceptable for re-use. Corrosion on the bottom has been noted (Figure 81, Building 3). The extent of topside corrosion cannot be fully known until the roof membrane is removed. Several areas had little to no corrosion and high efflorescence, it is our expectation that this is due to recent water leakage in these areas associated with storm-created openings above. Metal deck, where it is more highly corroded is questionable for re-use and should be fully exposed and inspected for re-use (Alternative Materials, 2006 IBC 104.11), or replaced to satisfy manufacturer requirements for solid substrate.
- 3.2 Damage from the storm has allowed water to effectively destroy the insulation value of the underlying materials requiring complete replacement of the roof membrane to access and replace the damaged insulation. According to information provided by the owner the damage on the interior occurred as part of the storm event.
- 3.3 There are water damaged materials under the EPDM, the top material is fiberboard, and is fully adhered (no stress plates were found during roof cores, nor were any visible through the membrane). The water-damaged materials must be removed as it is caused by the storm damage to the membrane. This water damage has reached the interior ceiling tile, thus whatever insulation boards are present are also expected to be water damaged in areas (core cuts support this). These damaged boards should be replaced as the water reduces their R value and the most expedient means to dry them out is to replace them.
- 3.4 As part of the re-roofing, it will be necessary to secure approval (by the building official) for reuse of any of the metal decking that is left in place, it must also be satisfactory to the insulation board manufacturer, membrane manufacturer and the building official.
- 3.5 Wind damaged the metal panel roofs, the parapet wall top caps and the roof penetration covers. These elements will also require removal and replacement.
- 3.6 Any attempt to “re-use” light weight insulating concrete will require either drying the system completely, or removal and replacement. Once the system is either dry or replaced and fully cured, fastener testing (for mechanically attached insulation will be needed). It is our expectation that large portions of this roof will be too wet when exposed and will also be damaged or destroyed by the water intrusion (See roof cores).

- 3.7 Repair to all roof-mounted HVAC units will be 'forced' due to removal and disconnection to replace roofing. IECC requires repairs to meet current code (2009 IECC 101.4.3). As some units are older, and some are currently in a hail-damaged condition there are several options to establish conformance. These options apply to any HVAC unit that is detached from the roof, whether damaged by the storm or not.
- 3.8 IECC requires repairs to meet current code (2009 IECC 101.4.3). As the units are currently in a damaged condition there are several options to establish conformance.

101.4.3 Additions, alterations, renovations or repairs.
Additions, alterations, renovations or repairs to an existing building, building system or portion thereof shall conform to the provisions of this code as they relate to new construction without requiring the unaltered portion(s) of the existing building or building system to comply with this code. Additions, alterations, renovations or repairs shall not create an unsafe or hazardous condition or overload existing building systems. An addition shall be deemed to comply with this code if the addition alone complies or if the exist-

ing building and addition comply with this code as a single building.

Source: 2009 International Energy Conservation Code

- A) Test units as-is to see if they conform to current codes for efficiency. If so, reinstall without any work needed. If the unit efficiency tests fail, select B, C, or D. (Least cost, highest risk of wasting money on testing).
- B) Comb the units, then test, if the unit efficiency tests fail, select C, or D.
- C) Replace coils with OEM coils, then test, if the unit efficiency tests fail, select D and replace the units. (Coil availability is unknown).
- D) Omit all the testing and replace the units. (Highest cost, least risk of wasting money on testing, least schedule impact, etc.)

3.9 The roof system (open web steel joist) was originally designed for the weight of a BUR system (see roof cores). Removing it reduces the load on the roof and creates some question as to an increase in net uplift on the joists, based on their age, they will need uplift bridging at a minimum at the first interior bottom panel point, as well as evaluation and design for the changed uplift conditions due to the weight change of the EPDM system (about 2 psf) from the BUR+EPDM (about $5.5 + 2 = 7.5$ psf), this needs to be done by a licensed civil or structural engineer.

At the same time, a full inspection of the LWIC/deck should be performed. If the engineer of record finds the deck acceptable it can remain in place, provided it is still in good condition similar to currently manufactured deck. Some sheets (based on observed rust) should be planned to be replaced at this time, with the deck attachment schedule and gage determined by the engineer with sealed drawings for the replacement and how it is to be attached to the existing materials.

3.10 Various additional items of note:

1503.3 Coping. Parapet walls shall be properly coped with noncombustible, weatherproof materials of a width no less than the thickness of the parapet wall.

[P] 1503.4 Roof drainage. Design and installation of roof drainage systems shall comply with Section 1503 and the *International Plumbing Code*.

1503.4.1 Secondary drainage required. Secondary (emergency) roof drains or scuppers shall be provided where the roof perimeter construction extends above the roof in such a manner that water will be entrapped if the primary drains allow buildup for any reason.

Secondary drains need to be provided (if missing), primary drains must be checked for size to re-use.

1504.3 Wind resistance of nonballasted roofs. Roof coverings installed on roofs in accordance with Section 1507 that are mechanically attached or adhered to the roof deck shall be designed to resist the design wind load pressures for components and cladding in accordance with Section 1609.

1504.3.1 Other roof systems. Roof systems with built-up, modified bitumen, fully adhered or mechanically attached single-ply through fastened metal panel roof systems, and other types of membrane roof coverings shall also be tested in accordance with FM 4474, UL 580 or UL 1897.

1504.3.2 Metal panel roof systems. Metal panel roof systems through fastened or standing seam shall be tested in accordance with UL 580 or ASTM E 1592.

Exception: Metal roofs constructed of cold-formed steel, where the roof deck acts as the roof covering and provides both weather protection and support for structural loads, shall be permitted to be designed and tested in accordance with the applicable referenced structural design standard in Section 2209.1.

1504.5 Edge securement for low-slope roofs. Low-slope membrane roof system metal edge securement, except gutters, shall be designed and installed for wind loads in accordance with Chapter 16 and tested for resistance in accordance with ANSI/SPRI ES-1, except the basic wind speed shall be determined from Figure 1609.

1504.6 Physical properties. Roof coverings installed on low-slope roofs (roof slope $< 2:12$) in accordance with Section 1507 shall demonstrate physical integrity over the working life of the roof based upon 2,000 hours of exposure to accelerated weathering tests conducted in accordance with ASTM G 152, ASTM G 155 or ASTM G 154. Those roof coverings that are subject to cyclical flexural response due to wind loads shall not demonstrate any significant loss of tensile strength for unreinforced membranes or breaking strength for reinforced membranes when tested as herein required.

1504.7 Impact resistance. Roof coverings installed on low-slope roofs (roof slope $< 2:12$) in accordance with Section 1507 shall resist impact damage based on the results of tests conducted in accordance with ASTM D 3746, ASTM D 4272, CGSB 37-GP-52M or the "Resistance to Foot Traffic Test" in Section 5.5 of FM 4470.

4.0 Requirements / Recommendations

Based on the findings during the limited investigation we recommend the following steps be taken.

Engineering will be required to check joists for changed uplift loads and to accept or replace metal deck (a global evaluation should be performed).

For re-roofing we do not see any items that require partial engineering. Follow 2009 International Building Code, and 2009 International Energy Conservation Code, with local amendments.

Contractor is solely responsible for adherence to all applicable safety requirements for work at heights.

- 1) Prior to starting work, consult with city on pedestrian protection and lighting requirements for the work.
- 2) During work that affects access to the businesses, protect pedestrians adequately from work and falling debris, tools, etc, (i.e. covered scaffolds, or similar. Such work is the means and methods of the contractor.
- 3) Temporarily disconnect rooftop air conditioner units as required to remove and replace roofing under and around air conditioner. NOTE: AIR CONDITIONER MUST REMAIN IN PLACE AND WORKING IF WORK IS DONE DURING SUMMER MONTHS.
- 4) Remove all layers of roofing including metal roofs and parapet cap, underlayment, cover board, rigid insulation, previous roof membranes to lightweight insulating concrete.
- 5) Remove any unacceptable metal roof deck, unless approved to remain in place by licensed civil or structural engineer. Replace as required per sealed drawings (profile, metal gage, attachment schedule). Secure approval of local building official for reuse of existing roof deck.
- 6) Contractor's option: Dry out LWIC or replace. If LWIC is to be replaced, verify against available fire-rated assemblies.
- 7) Determine fire-rating requirements for the roof assembly. Architect to review roof assembly requirements and items listed above and issue sealed drawings for reconstruction of ceiling and roof membrane/assembly UL rated system as required.
- 8) Conform with any special inspection or structural observation requirements from the architect's or engineer's sealed plans and coordinate approval with the building official.
- 9) Roof covering shall conform with UL requirements on existing construction documents unless specifically reviewed, revised, and sealed by a licensed architect (i.e. a new UL rated roof assembly including the ceiling), and approved by the building official. Contractor Note: Secure architectural services for this if the existing plans cannot be located or if a change to the UL assembly is desired.
- 10) Verify placement of vapor retarder per (energy) code.
- 11) Once LWIC is acceptable for installation of base sheet, install per manufacturer's requirements and test mechanical fasteners as required.
- 12) Conform to current energy code for above roof deck insulation. Install base rigid insulation to meet current energy code (Contractor shall verify R-20ci applies). Attach per manufacturer's requirements, or install new insulation per Architect's sealed drawings (or manufacturer tested attachment schedule) to meet code. Insulation requirements for roofs have changed since the roof was originally constructed.

- 13) Roofing components will require attachment schedule per FM or manufacturer for code imposed loads at 90 mph, Exposure C.
- 14) Review of drainage on roof (drain quantity and size, conductors, leaders, scuppers, etc.) by mechanical engineer if not constructed as originally specified by a licensed mechanical engineer. Review, per International Plumbing code, should verify all items for 100 year hourly rainfall per P1106.1 (See IBC 1503.4), or similar document acceptable to the building official. Modifications may be required due to age of construction. If existing plans can be found, this step may be eliminated if the drainage plans are constructed/reconstructed as shown on those plans and those plans were stamped by a licensed mechanical engineer, and secondary drains are provided per current codes. We do not have Mechanical Plans for these buildings.
- 15) Roof drainage per IBC 1503.4, is for the number of scuppers/interior drains, not a study of the impact of this drainage to the watershed/infrastructure. Note: Secondary drainage is required per 2009 IBC 1503.4.1 when parapets exist such that water will be entrapped if the primary drains allow build-up for any reason.
- 16) Install topside tapered insulation per mechanical engineer's sealed layout drawings and attach per manufacturer's requirements for 90 mph uplift. Note: This is in addition to any insulation on the roof for energy code conformance (required per code as well as EPDM manufacturer). Attach to base insulation sheet per manufacturer's requirements.
- 17) Install tapered insulation per manufacturer requirements, including secondary deflection to scuppers or overflow drains (i.e. crickets). Note: the $\frac{1}{4}$ " per foot slope requirement applies at the low roof edge against the parapet wall, full length of the wall between the through-the-wall scuppers.

1507.12 Thermoset single-ply roofing. The installation of thermoset single-ply roofing shall comply with the provisions of this section.

1507.12.1 Slope. Thermoset single-ply membrane roofs shall have a design slope of a minimum of one-fourth unit vertical in 12 units horizontal (2-percent slope) for drainage.

- 18) We suggest contacting GAF tapered roofing group (or similar) for further assistance on a complete tapered system.
- 19) Replace damaged metal roofs, ridge covers, and parapet caps.
- 20) Replace roof jacks, vents, and other roof items (more cost effective than removing, securing approval from building official to reinstall).
- 21) Replace roof flashings and other roof metal (more cost effective than securing re-approval for reinstallation of materials).
- 22) Install replacement roofing per manufacturer's requirements. Note: Replacement roofing shall match existing roofing (EPDM). This is to avoid engineering evaluation due to 5% weight change on the roof. Note: Reducing the weight creates larger uplift on the roof deck, open web steel joists, etc, and is not advised.
- 23) Construction and engineering (diaphragm evaluation and connection/collector review) will have to comply with ASCE 7-05. Licensed civil or structural engineer of record shall verify. Change to uplift based on change to roof dead

weight will necessitate a full review of load path and structural framing. As much as practical, we advise against changing the dead load on this roof.

- 24) Provide/obtain/perform uplift testing as required.

1504.3 Wind resistance of nonballasted roofs. Roof coverings installed on roofs in accordance with Section 1507 that are mechanically attached or adhered to the roof deck shall be designed to resist the design wind load pressures for components and cladding in accordance with Section 1609.

1504.3.1 Other roof systems. Roof systems with built-up, modified bitumen, fully adhered or mechanically attached single-ply through fastened metal panel roof systems, and other types of membrane roof coverings shall also be tested in accordance with FM 4474, UL 580 or UL 1897.

Note: This testing is generally manufacturer testing included with stock products.

- 25) All rooftop penetrations, drains, skylights and other items (HVAC) will have to be lifted and reset. Reconstruct roof curbs as needed. Items to be reinstalled must be tested to demonstrate equivalence to new items, per code, and energy/air infiltration requirements, per IECC. Contractor's option: Discard and replace items with new units that meet code/engineer specified design pressures.
- 26) Inspect air conditioners for efficiency, if older, test for efficiency. If units do not meet current energy code efficiency requirements, replace AC units.
- 27) Install noncombustible, weatherproof (i.e. metal) perimeter flashing per ES-1 standard and code and manufacturer's requirements, typically with a cleat into the parapet wall. (See IBC 1504.5)

1504.5 Edge securement for low-slope roofs. Low-slope

built-up, modified bitumen and single-ply roof system metal edge securement, except gutters, shall be designed and installed for wind loads in accordance with Chapter 16 and tested for resistance in accordance with Test Methods RE-1, RE-2 and RE-3 of ANSI/SPRI ES-1, except V_{ult} wind speed shall be determined from Figure 1609A, 1609B, or 1609C as applicable.

- 28) Remove and replace water-damaged ceiling tiles, ceiling grid, and light fixtures. Replace water damaged ceilings and light fixtures (Electrician needed for light fixtures). Tiles shall match existing. Verify tiles are not required to be fire-rated (contact Architect, or find existing sealed architectural drawings) when they form a continuous system.
- 29) **Energy code requirements have not been finalized. Integration of existing building systems with vapor retarders, application of sealants, flashing and other items are the responsibility of the contractor.**
- 30) Contractor shall remain on alert for signs of mold during repairs and construction.
- 31) Alternate construction techniques may be acceptable provided a licensed design professional approves and signs and stamps plans and or shop drawings for these repairs. Means and methods are the Contractor's responsibility.

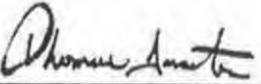
- 32) Stability during construction is the responsibility of the Contractor. Structure as detailed is intended to be stable once all sheathing and fasteners are in place.
- 33) Conform with any special inspection and testing schedules issued by the engineer.
- 34) Remove water damaged interior materials and effect repairs pursuant to current published guidelines by the Clean Trust (formerly the Institute for Inspection, Cleaning, and Restoration Certification, or IICRC) guidelines.
- 35) Roofing, siding, and sheathing attachment will have to comply with City of Bessemer wind speeds. This appears to be 90 mph, Exposure C, but engineer / contractor shall verify).

Note: Contractor shall make certain any roofing to be installed meet the requirements of the code in force through verification with the building official. Selection and installation of appropriate wind-rated and fire-rated roofing in compliance with the manufacturer's requirements and any associated third-party inspections required by the jurisdiction are the responsibility of the contractor.

Discovery is ongoing. Additional testing and inspections may need to be performed and additional and/or supplemental information and opinions may be contained in future reports issued by Forensic Building Science, Inc. This report is the exclusive property of the client noted previously and cannot be relied upon by a third party. Copies of this report are released to third parties only by written permission of the client.

Please contact our office should you have any questions or need additional information.

Respectfully submitted,



Digitally Signed
Tom Irmiter, President Forensic Building Science, Inc.
International Code Council Residential Building Inspector
and Property Maintenance Inspector, cert #5313388

August 20, 2015
Date



CITY OF BESSEMER
DEPARTMENT OF INSPECTION SERVICES

DANGER - KEEP OUT

**CONDEMNED
AS
Dangerous and Unsafe**

This building is unsafe and its use or occupancy has been prohibited by the BUILDING DEPARTMENT

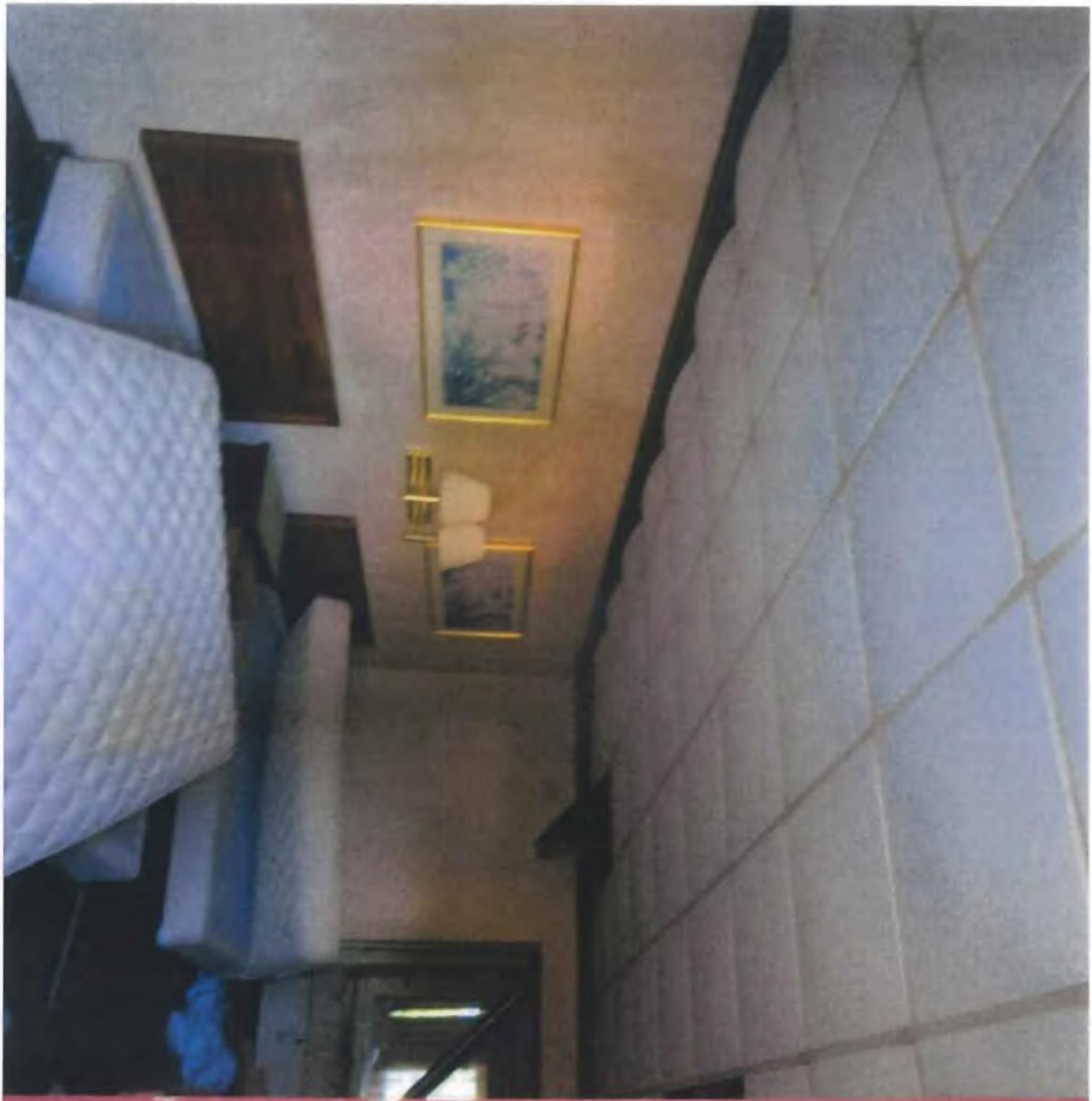
All persons are hereby notified to keep out as long as this notice remains posted.
Any persons willfully destroying, mutilating or removing this card will be punished to
the full extent of the law.

Posted under authority granted in the International Property Maintenance Code
as adopted by the City of Bessemer

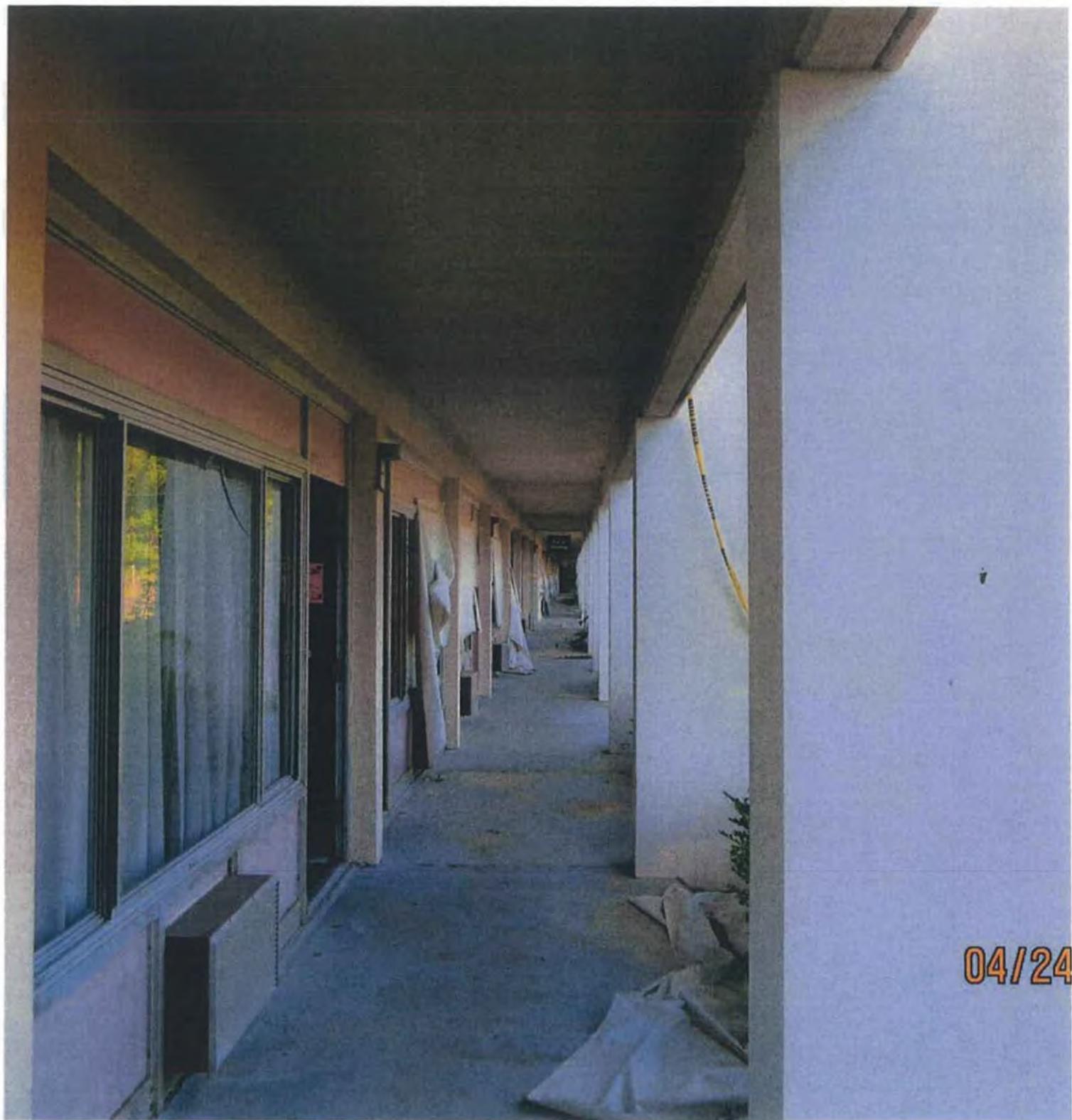
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DEPARTMENT OF INSPECTION SERVICES

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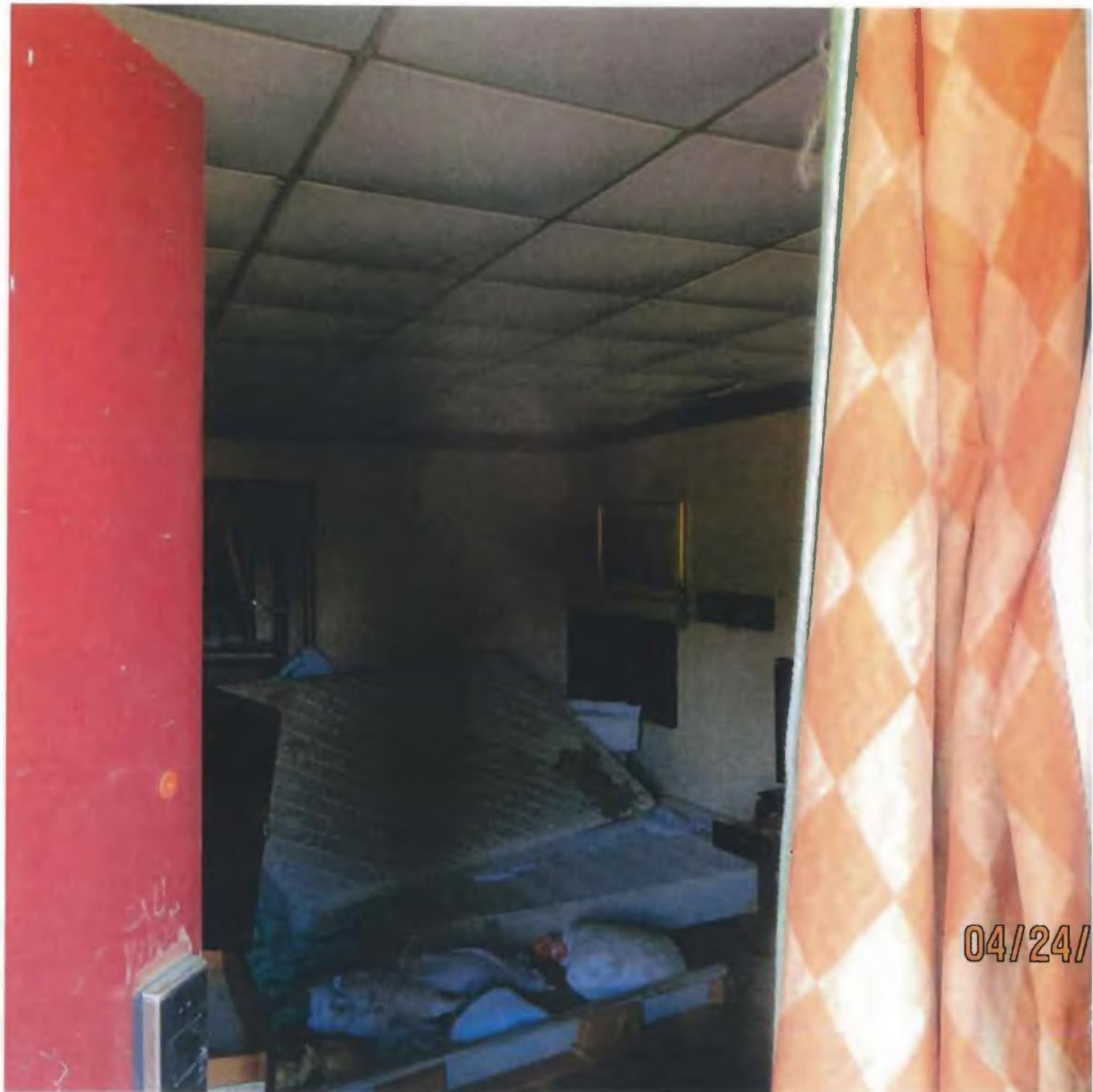


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